WEEKLY

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VOLUME XLIII
No. 1

July 5, 1917

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UM

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to obtain the best material for surfacing your streets.

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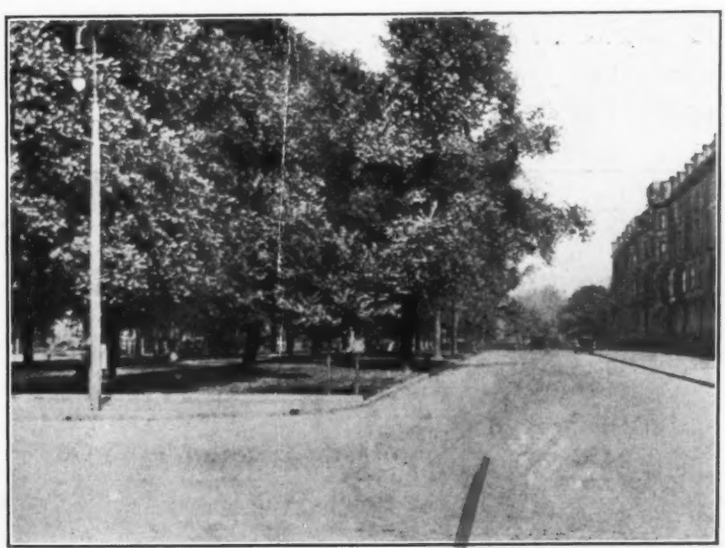
has been adopted in over 400 cities as a standard construction for their streets.



Bitulithic Pavement, laid over old macadam, Commonwealth Avenue, Boston, Mass., at intersection of Berkeley Street, showing Parkway on left, Public Gardens in background.

Don't Neglect Your Streets

they should be kept up in first class condition to enable you to save the city's money.

You Can't Save Money by Constant Repairing inferior Construction every year.

Get the Best in the beginning—Specify and insist on Bitulithic.

It is the Pavement you are looking for. It will stand up under the modern automobile traffic which has raised havoc with so many types of Construction.

Let us help you solve your paving problems — Bitulithic will do it.

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"PIONEER"

Mich., June 2, 1917.

Pioneer Asphalt Co.,
Lawrenceville, Illinois.
Gentlemen:

I am sending you under separate cover a picture (**see reproduction below**) I took on Porter Street a few days ago.

This pavement was laid in 1910 with * * * Block and Pioneer Filler. This shows how the filler has worn better than the brick. Notice that the joints are full.

This street parallels the Grand Trunk Tracks.

Very truly yours,

City Engineer.

We will be pleased to furnish you with name of town and City Engineer who wrote this letter.

THE PIONEER ASPHALT COMPANY

PRODUCERS OF HIGHEST QUALITY BITUMINOUS PRODUCTS

LAWRENCEVILLE, ILL.

PAVEMENT LAID IN 1910 WITH BLOCK AND PIONEER FILLER

Municipal Journal

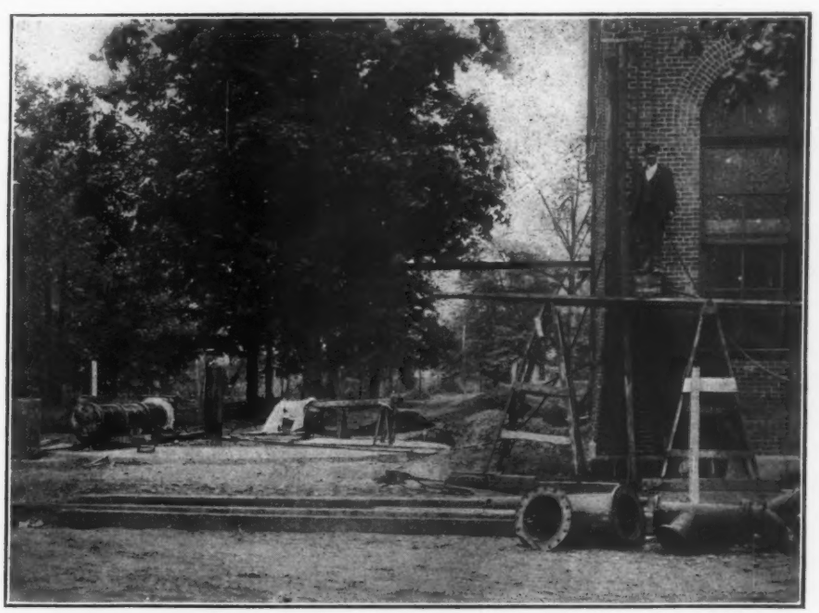
Volume XLIII NEW YORK, JULY 5, 1917 No. 1

EXPERIENCE WITH A VITRIFIED WATER CONDUIT

Making Water-Tight Joints in a Line of Eighteen-Inch Vitrified Pipe—Bituminous Compounds Used—Difficulties Due to Use of Cement—Methods of Making Tests and of Repairing Leaking Joints.

For several years past the Bureau of Sewers of Brooklyn, N. Y., has used successfully for making water-tight joints in vitrified pipe a joint compound composed of an bituminous mixture. In 1912 the Bureau of Water Supply of New York was considering the use of vitrified pipe for constructing certain conduits, and tested 12-inch vitrified sewer pipe with joints made with "G. K. compound" and "Jointite," both bituminous compounds. This test showed that such a joint would stand 29 pounds pressure per square inch. At the same time the bureau tested joints made of plain yarn, those of yarn soaked in cement grout, and joints of lead wool, all of which gave very unsatisfactory results. At an earlier date poured cement joints also had been found to leak freely. The laboratory examined the mixture known as "Filtite A," which had been used by the Sewer Department, and reported it to be "a compound of asphaltic base with petroleum residue, containing about 50 per cent. of mineral matter. It is apparently unaffected after 48 hours' immersion in fresh and salt water and in weak acid and alkaline solutions. Previous experiments upon similar materials indicate that it will not be materially affected. At 205 degrees F. it is a viscous liquid flowing somewhat slowly like cylinder oil. After two hours' exposure to a temperature of 220 degrees F. it loses only 0.11 per cent. in weight."

On the basis of this report and the test previously made, the bureau in 1914 decided to use vitrified pipe for a certain portion of the work on Staten Island. This island was supplied by a driven well system, the supply being derived from five groups of wells from which the the water was drawn by means of electrically driven centrifugal pumps and delivered into collecting lines through which it flowed to a pump well at a central pumping station. It was for carrying the water from the wells to the pumping station that there was used 7,460 feet of 18-inch vitrified pipe and 557 feet of 24-inch vitrified pipe. Vitrified pipe was used in preference to cast iron chiefly because the substitution of 18-inch vitrified pipe for 16-inch cast iron reduced the estimated cost from $27,000 to $20,000, and it was expected that not more than two years would elapse before this service would be abandoned and the supply obtained from the Catskill Mountains. There was no fear of the pipe itself being of insufficient strength, since it was estimated that the maximum pressure under working conditions would be about 5 pounds per square inch.



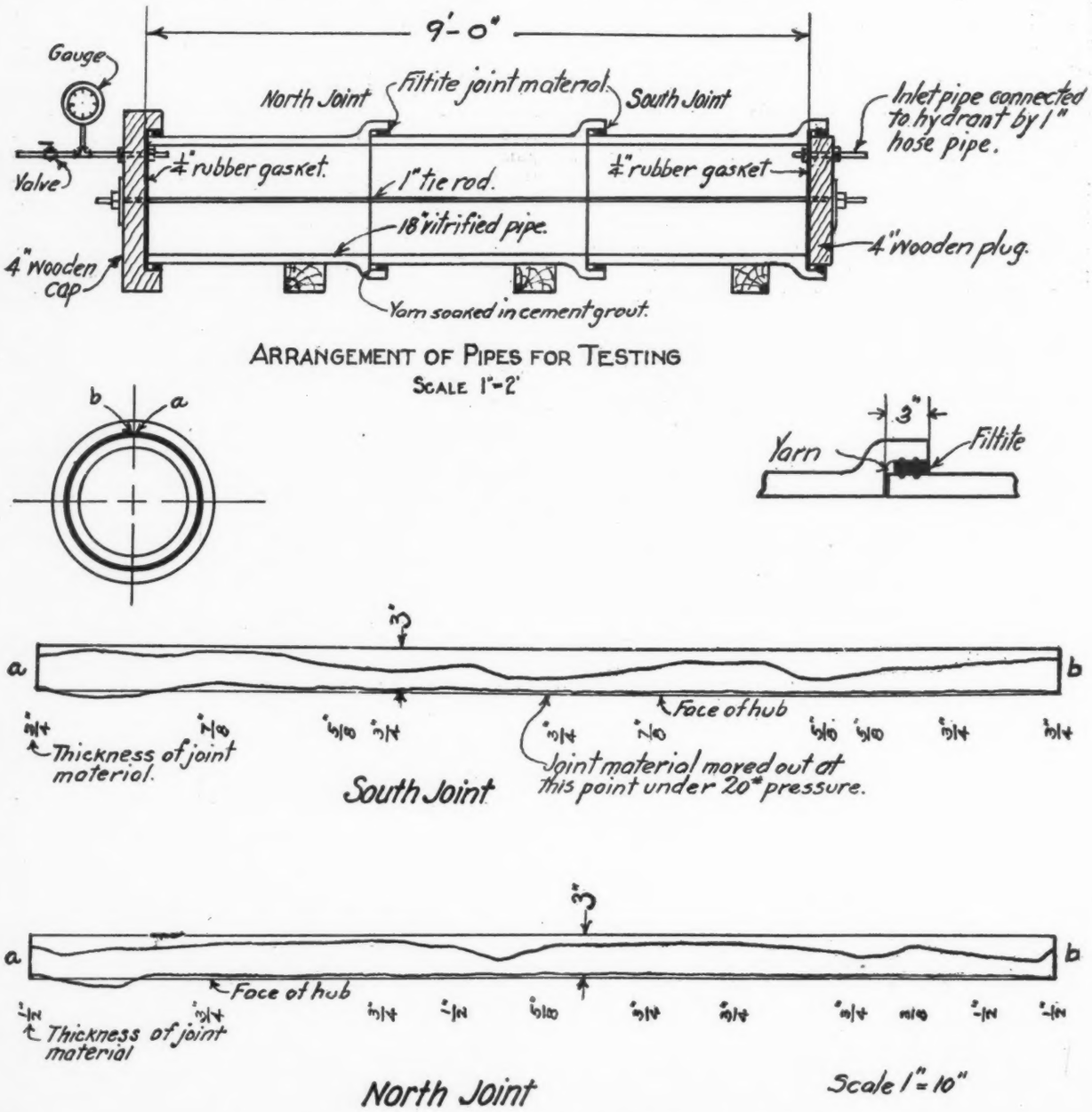
MAKING TEST OF JOINTS IN 18-INCH VITRIFIED PIPE.
Hydrostatic pressure produced by column of water with 12-foot head.

It was specified that the inside of the hub and outside of the spigot of the vitrified pipe were to be corrugated and that a special method of making the joints, as described in the next paragraph, should be employed. The pipe was laid to grade on the bottom of the trench.

The bid accepted for furnishing, delivering and laying the 18-inch vitrified pipe was 90c per lineal foot, and that for laying the 24-inch pipe $1.25 per lineal foot; while the bid for earth excavation and backfilling was 50c per cubic yard.

The method of making the joints was not that usually followed in using this material for sewer work, but it was provided that "a gasket of packing yarn, dipped and saturated in cement grout, which shall have been mixed not more than 30 minutes previously, shall be firmly rammed into the joint with a hard wood calking tool. Such gaskets shall be in one continuous piece of a length sufficient to reach entirely around the pipe and give a lap, and of sufficient thickness that when rammed in place the connected pipes shall be firmly held to their proper concentric position. If necessary, one or more additional gaskets of the same kind shall be driven into the hub so as to fill it to a total depth such that a depth of about 2 inches will remain for the joint material." This joint material was specified to be such as would run freely at not higher than 250 degrees F., should adhere well to the glazed surface of earthenware pipes, should be elastic enough at ordinary temperatures to permit slight movement but not become soft enough to run out of the joints.

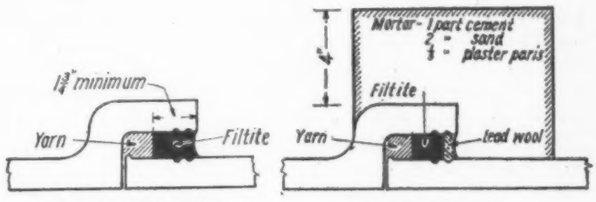
It was specified that the hubs and spigots should be thoroughly cleaned before the joint was poured. The engineer in charge of field work has stated that the space left for the joint material was cleaned as thoroughly as possible of the grout which was smeared on the inside of the hub and on the spigot in the process of calking the grout-soaked yarn. Later examinations and tests seemed to indicate, however, that this cleaning was not thorough and it is possible that it would be impracticable in actual work to secure total removal of all such smear of cement from the pipe surface.



METHOD OF MAKING JOINTS AND DEVELOPMENT OF SAME.

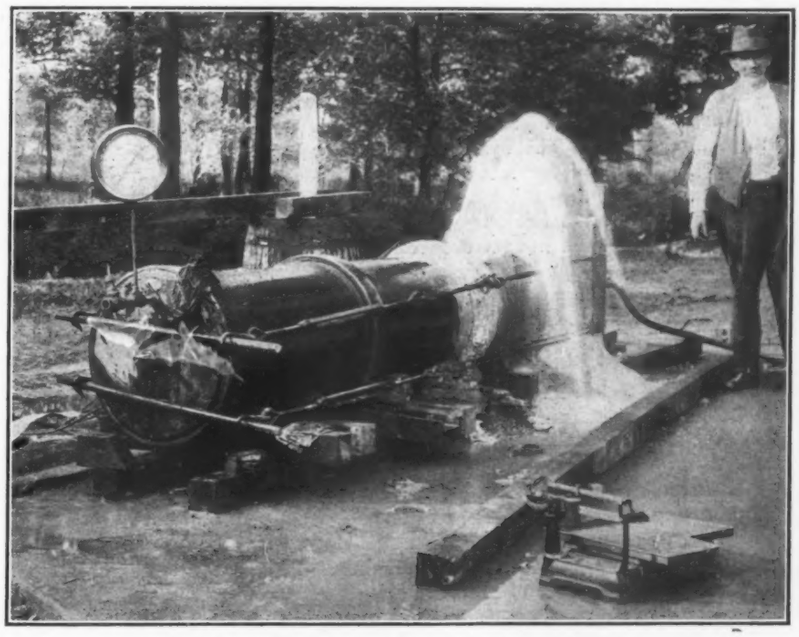
After the construction of the pipe line had been completed, it was noticed that ground water was entering the pipe, averaging 43,470 gallons per day during a 3-day test, which was equivalent to 163 gallons per joint per 24 hours. A few weeks later the pipe line was tested, the head being about the working head and at 22 points in a distance of 1,261 feet water showed on the surface. An examination of the line was then made and leaky joints were found to be due to three causes; first, a separation between the joint compound and the barrel of the pipe or between the joint compound and the hub. This separation varied from the merest hair line opening to an amount which would admit the passage of a knife blade. Second, joints in which the compound had started to blow out, in general more at the bottom of the pipe than at the top, varying from the merest indication of starting to cases where pieces of the compound were ready to fall out. Third, joints where the material at the bottom had entirely blown out. Both the contractor and the city, were, of course, interested to learn the cause of this failure, when such good results had been expected and had been experienced in other work. In cutting out defective joints it was found that in many cases cement was adhering to the compound, showing that, in spite of careful washing and cleaning of the joint space after the cement-soaked yarn had been calked home, some cement had adhered to the hub and spigot of the pipe. The gray coloring of the cement could still be noticed on the pipe in the joint space, even after the joint compound had been cut out. The manufacturers and also the contractors stated that use of the cement-soaked yarn was not customary and had not been used on sewer work on which the same contractor had used similar compounds. The engineer in charge of the work stated it as his opinion, "after careful personal observation while making repairs to this line and the behavior of test joints made and referred to in my report of April 19, 1915, on these repairs, as well as the apparent fact that this cement grout-soaked yarn has not been used on similar joints for this class of work, that a thin film of Portland cement grout adheres to the sides of the joint space, no matter how carefully cleaned, and does prevent any adherence of a joint compound having an asphaltic base; and I would recommend in the case of such leaks as do appear that such joints be cut out, thoroughly cleaned, recalked with clean, dry yarn and the joint re-run with joint compound. While I do not believe that a vitrified line can ever be made as tight as a cast iron main laid in the usual manner, I do believe that this line can in this way be made reasonably tight and serviceable for the period of time it is expected that it would be required."

This line was continued in service until February, 1917, when it was shut down and use of the Catskill supply was begun in Richmond borough (Staten Island). Up to this time a few leaks had been found and stopped every month. In stopping these leaks, the contractor removed the joint material and re-ran the joint. After the expiration of the 12 months maintenance period provided for by his contract, the department tried various schemes, the one mainly used by it being to drive the joint material into the hub, calk in lead wool, and then place a concrete block around the joint, as shown in the illustration. It was found that in driving the joint material into the hub the bond between such material and the pipe was broken and it is probable that after this such material was of little service in preventing leakage.



METHOD OF REPAIRING JOINT.

After these leaks had been discovered, tests were made, one at Grant City and one at the Portland avenue yard in Brooklyn. The illustrations shown herewith are from photographs of the Grant City test. In this test three lengths of 18-inch vitrified pipe were set on a timber grill and supported in line and grade by wooden wedges. Each end of the line was closed with a wooden bulkhead, the two bulkheads being tied together by an iron rod as shown in the illustration. The two joints between the pipe were calked with grout-soaked yarn, after which the joint space was thoroughly cleaned and dried. It would appear from the results that in this case the cleaning was performed more thoroughly than it seemed practicable to obtain in the actual work. After the pipes had dried, the joints were run with the compound and three days later were filled with water and subjected to pressure. At 11:05 A. M. the pipes were full and the air valve was closed, and a head of 4 feet was applied. At 12:40 the head was increased to 8 feet and at intervals of a few minutes the head was increased one foot at a time until at 2:55 it had been increased to 12 feet. Owing to rain the test was then stopped and the pipe emptied. Four days later the pipe was again filled and subjected to a 12-foot head and this head maintained for 24 hours before showing any leak-



PIPE BURSTING AT PRESSURE OF 40 POUNDS.

age. The test was kept on with slight leakage until June 14th, when the pressure was slowly raised to 35 pounds, at which there was a leakage from one joint of 232 gallons per 24 hours. The pressure was then raised to 40 pounds, when the pipe split, as shown in one of the photographs.

The lesson to be learned from this experience apparently is that care must be taken that foreign material, including Portland cement, be entirely removed from vitrified pipe when using asphaltic joint compounds; but that if this is done a joint can be obtained that is tight under at least a 10-ft. or 15-ft. head. It also seems probable that the practice, in making such joints, of soaking the yarn in cement grout before calking it into place is seriously objectionable and possesses little advantage to offset the objectionable features.

For the above facts and for the illustrations used we are indebted to William W. Brush, deputy chief engineer of the Bureau of Water Supply, who embodied them in a paper delivered before the American Water Works Association.

UNDERGROUND SURVEY IN PHILADELPHIA.

During the year 1916 the Bureau of Highways of Philadelphia had three field corps and a checking corps employed in surveying the surface and underground structures of 232 miles of highways. The data obtained by the field work were plotted and recorded in pencil on 8x10-inch cards, which cards served both as field book and as final record. These cards are being completed in the office in finished form as rapidly as possible, and in the meantime the information on them is in such shape as to be readily accessible for guidance in assignment of location for proposed new structures.

The work of revising and bringing up-to-date the plans already on file was kept up throughout the year. At the present time there are on file in the department records of structures in 1,017 miles of streets, records of 473 miles being on 25x29-inch plans, those of 522 miles being on the 8x10-inch cards in pencil only, and those of 22.5 miles on 4x10-inch cards fully completed. At the end of the year approximately 390 miles of streets remained to be surveyed and it was hoped to complete that work within the year 1917, after which only a sufficient number of men will be retained to survey new streets and record changes in existing structures.

These records are of the most vital importance to the city and their replacement would require years of time and the expenditure of thousands of dollars in case they should be destroyed by fire. In order to provide duplicates to insure against any possibility of the information being entirely lost, a photostat machine was installed in 1916, which, by a photographic process, makes a full-size print to exact scale direct from the 25x29-inch plans and at a cost very much less than that which would be required to make tracings of the plans. By the end of the year about one-sixth of the plans had been so reproduced and the duplicates placed in a fire-proof vault.

WATERWORKS STATISTICS.

In our issue of May 3rd we published statistics of more than eight hundred cities, covering details of waterworks installations and practice as furnished for this purpose by the superintendents of the several cities. A few replies to our inquiries were received too late for that issue, and these we are presenting this week in the following tables. These forty-five cities complete the list of those from whom we have received this information.

TABLE NO. 1—GENERAL WATER WORKS STATISTICS.

City	Population	No. supplied with water	Average consumption	Per cent metered	Source of supply	Per cent of total supply pumped	Head pumped against	Pumped to	Kind of power used	Kind of pump	Purification process
Arkansas:											
Hope	6,000	.....	400,000	82	Wells	All	150 ft.	Reservoir & 100 ft. to tank	Steam piston	Air lift, hor. recip.	None
California:											
Los Angeles	550,000	525,000	55,000,000	..	River & imp. res.	....	25-275 ft.	Reservoir	Steam & elec.	.....	Infiltration galleries
Colorado:											
Lamar	4,000	4,000	296,600	..	Underground flow of dry stream	None	.....	.....	.....	.....	None
Connecticut:											
Ansonia	12,000	11,000	1,800,000	80	Stream	None	.....	.....	.....	.....	None
Illinois:											
Chester	3,000	130	30,000	..	River	All	180 lbs.	Standpipe	Steam	Recip. duplex, high duty	None
Lewistown	3,000	2,000	.....	..	Large well	All	300 ft.	Standpipe	Steam piston	Hor.	None
Lincoln	11,000	1,725	903,319	..	Wells & infilt. gallery	All	100 ft.	Standpipe	Steam piston & electric	Duplex power, duplex tandem comp., direct	None
Iowa:											
Marshalltown	17,000	13,000	1,800,000	70	Driven wells in gravel	All	170 ft.	Standpipe	Steam piston	Hor. direct	None
Kansas:											
Dodge City	5,500	4,800	350,000	50	140 ft. wells	All	135 ft.	Standpipe	Steam piston	Recip. hor.	.....
Kentucky:											
Morganfield	3,500	1,000	160,000	20	Wells	All	100 lbs.	Reservoir	Steam piston	Reciprocating	None
Maine:											
Farmington	2,100	1,800	.....	..	Lake	None	85 lbs.	Standpipe	.....	.....	None

TABLE NO 1—GENERAL WATER WORKS STATISTICS (Continued).

Maryland::											
Baltimore	625,800	650,000	85,000,000	25-30	Imp. reservoir	†	†	†	Steam piston & electric	Recip. vert. & hor., centrif.	Rapid filtration & chlorine
Massachusetts:											
Dalton	3,800	.....	800,000	None	Reservoir	None	....	.....	.....	.....	None
Danvers	11,000	11,000	1,250,000	..	Lake	All	80 lbs.	Reservoir	Steam	Horizontal	None
Falmouth	3,500	.....	356,306	Small	Lake	All	80 lbs.	Standpipe	Steam piston	Davidson	None
Woburn	16,410	16,300	2,235,362	50.9	Filt. Gallery & well	All	220 ft.	Reservoir	Steam	Vert. & hor.	None
Michigan:											
Detroit	734,562	781,133	127,565,434	53	River	All	48-66 lbs.	Direct	Steam piston	comp. beam, vert. triple recip.	Liquid chlorine
Minnesota:											
Ely	5,000	.....	500,000	..	Lake	All	100 ft.	Standpipe	Steam piston	Comp. crank & fly wheel, cross comp. duplex	Filtration
Mankato	.....	8,680	800,000	100	Artesian wells	All	225 ft.	Reservoirs	Electric, steam piston	Centr. & recip.	.....
Minneapolis	370,000	350,000	29,500,000	98	River	All	242 ft.	Reservoir	Elec. & steam	Centr. & triple expansion	Rapid filt'n
Moorhead	5,000	.....	220,000	..	Wells	All	50 lbs.	Standpipe	Electric	Downie deep well	None
Nebraska:											
Aurora	3,000	750	.....	..	Wells	All	105 ft.	Standpipe	Elec. & steam	.....	None
Fairbury	6,500	1,000	300,000	100	Spring	All	179 ft.	Standpipe	Steam piston	Reciprocating	None
New Hampshire:											
Lancaster	3,500	2,500	.....	..	Mountain brook	None	.....	.....	.....	.....	None
Pembroke	3,000	3,200	.....	None	Pond	None	.....	.....	.....	.....	None
New York:											
Canastota	4,000	3,000	250,000	100	Springs	None	.....	.....	.....	.....	None
Oneida	8,500	.....	.....	98	Springs	200 ft.	.....	.....	.....	.....	None
Rochester	250,000	250,000	23,000,000	70	Lakes	None	.....	.....	.....	.....	None
Watervliet	17,000	16,000	2,000,000	..	Imp. reservoir	All	82 ft.	Reservoir	Hydraulic	Centrifugal	Rapid filter & chlorine
Ohio:											
Montpelier	3,600	.....	500,000	50	Wells	All	45 lbs.	Standpipe	Steam piston	Air lift, duplex comp. direct	None
Oberlin	5,960	5,600	286,000	..	River	All	85 ft.	Standpipe	Steam piston	.....	Rapid filter
Warren	.....	.....	1,500,000	90	River	All	138 ft.	Standpipe	Steam piston, hydraulic	Hor. & vert. recip.	Rapid filter
Oklahoma:											
Miami	6,000	.....	300,000	All	Wells	All	60 lbs.	Tank	Steam piston	Air lift	None
Oregon:											
McMinnville	5,000	4,000	700,000	25	Mountain stream	50	70 lbs.	Direct	Electric	Power plunger	Rapid filter
Pennsylvania:											
Harrisburg	80,000	.....	8,326,733	83	River	All	235 ft.	Reservoir	Steam piston	Vert. trip. & hor. comp.	Rapid filter
West Newton	3,000	2,200	150,000	55	Wells & springs	95	135 lbs.	Reservoir	Electric & int. comb.	Air lift, Vert. triplex	None
Texas											
Orange	12,000	6,000	800,000	81	Artesian wells	All	40 lbs.	Standpipe	Steam piston	Vertical	.....
Sulphur Springs	8,500	3,000	.....	65	.....	.....	150 ft.	Standpipe	Steam piston	.....	Precipitation
Terrell	8,000	4,700	130,000	100	Wells	All	60 lbs.	Reservoir	Steam	Direct acting	None
Waco	45,000	.....	3,800,000	50	Artesian wells	All	85 lbs.	Standpipe	Steam piston	Crank & fly whl.	Filtration
Virginia:											
Winchester	6,445	7,000	1,000,000	20	Spring	All	250 ft.	Reservoir	Steam piston, electric	Recip. centr.	Chlorine
Washington:											
Spokane	130,000	113,100	19,525,744	73	Wells	All	370 & 200 ft.	Reservoirs	Hydraulic, electric	Centr., recip.	None
Wisconsin											
Monroe	5,000	3,500	190,000	88	Artesian wells	All	190 ft.	Standpipe	Steam piston	Air lift, triplex, comp.	None
Wyoming:											
Laramie	8,000	8,000	4,000,000	None	Springs	None	.....	.....	.....	.....	None

*Part of supply only. †All pumped 15 ft. to filter. Then 67% by gravity, rest pumped against 110 lb. to reservoir, and 2% repumped against 145 lb. to standpipe and 1% against 100 lb. to standpipe.

BITUMINOUS SURFACE TREATMENT IN PHILADELPHIA.

The practice of surface treating waterbound macadam roads with bituminous materials was begun by the Bureau of Highways of Philadelphia in 1912. At that time only a few roads were in a sufficiently good condition to warrant this treatment, but during the past three years the roads of the city have been placed in such excellent condition that bituminous surface treatments have been applied to practically the entire yardage of macadam roads throughout the city.

In the case of dirt roads and the few macadam roads that are not in first class condition, these are given a treatment of dust-laying oil, which, while it has but slight influence on the durability of the road, gives material service as a dust layer. The cost of treatment has continually decreased from an average of 7.3 cents in 1913 to 5.03 cents in 1915, the decrease being due both to decreasing amounts of material required and increased efficiency of the working force and more effective planning for the work. The cost in 1916 rose to 5.34 cents, largely because of the increase in cost of materials and

TABLE NO. 2.—DISTRIBUTION SYSTEM.

City	Ownership	Conduit to city: Length miles or feet	Conduit to city: Size inches	Conduit to city: Material	Length of street mains in service—cast iron unless otherwise indicated. w.i.= wro't iron; wd.= wood; stl.= steel. 3" & under	4"	6"	8"	10"	12"	14" or larger
Arkansas:											
Hope	M	1	.....	.....	17 c.i.	.....	21,250	5,900	2,500	.....	.....
					25,000 w. i.	.....					
California:											
Los Angeles	M	275	Various	stl & con	.....	2,521,996	1,170,331	271,487	.....	.....	.....
								47,931 w.i.	.....	.....	.....
Colorado:											
Lamar	M	3	10	stl., tile &	.....	.....	.....	.....	.....	.....	.....
		9.5	12	wd. st've	.....	13	½	1½	½	2	.....
Connecticut:											
Ansonia	P	2	10 & 24	c. i.	3,000	26,250	20,500	15,500	4,450	3,500	4,000
Illinois:											
Chester	P	.....	.....	.....	1,400 w.i.	10,690	2,500	5,000	.....	.....	.....
Lewistown	M	15,300	8	c. i.	3,225	22,525	1,500	3,000	.....	.....	.....
Lincoln	P	2,200	14	c. i.	25 miles, all sizes, c. i. pipe.				.....	.....	.....
		2,200	24	c. i.	5 miles, wrought iron pipe				.....	.....	.....
Iowa:											
Marshalltown	M	300	24	c. i.	4,295 w. i.	40,627	.....	139,380	24,740	1,588	9,917
Kansas:											
Dodge City	M	.....	.....	.....	.....	40,000	19,000	8,000	2,000	1,000	.....
Kentucky											
Morganfield	M	.....	.....	.....	.....	5	2	1	.....	.....	.....
Maryland:											
Baltimore	M	37,000	144	tunnel	95,278	731,888	1,546,981	53,535	471,037	154,690	443,313
Maine											
Farmington	M	.....	10	c. i.	1,500 w.i.	2,500	1	½	.....	.....	.....
Massachusetts:											
Dalton	M	2	19	c. i.	6,000	35,000	9,000	6,000	6,000	.....	.....
		1	12								
		1	14								
Danvers	M	.....	18	c. i.	33,650 w. i.	28,397	46,437	16,533	.....	41,220	.....
		.....	.....	.....	.....	80,803 cmt.	12,031 cmt.	9,432 cmt.	.....	13,843 cmt.	.....
Falmouth	M	.....	12	.....	....	.....	.....	.....	.....	.....	.....
Woburn		1½	16	c. i	52 miles of pipe		.....	.....	.....	.....	.....
		1	12	cement	54.85 miles wood pipe in use		.....	.....	.....	.....	.....
Michigan					.....	.....	.....	.....	.....	.....	.....
Detroit	M	.....	.....	.....	53,967	764,033	2,451,762	383,789	249,285	219,747	416,603
Minnesota:											
Ely	M	1,500	10 & 12	.....	.....	4,508	15,102	1,717	3,327	3,327	.....
Minneapolis	M	.....	50 & 54	steel	.....	.....	1,817,508	465,742	16,147	395,996	342,118
Moorhead	M	150	16	.....	.....	26,738	28,842	3,577	2,985	3,425	.....
Nebraska:											
Fairbury	M	1½	12	c. i. & wd. stave	2 bl'ks w.i.	10	1	1	.....	.....	.....
New Hampshire:											
Lancaster	M	1	12	c. i.	.....	.....	.....	.....	.....	.....	.....
Pembroke	M	1	16	wd. stave	.....	1½	1	1½	.....	1½	.....
		1	14				2 wood	2 wood	½	1½	.....
		12	12								
New York:											
Canastota	M	3	12	c. i.	2 w.i.	5	4	2	.....	.....	.....
Oneida	M	3	12-16-18	c.i.	19½ miles in all		.....	.....	.....	.....	.....
Oswego	M	.....	.....	.....	5,360	.....	.....	.....	.....	.....	.....
					179 w.i.	.....	.....	.....	.....	.....	.....
Rochester	M	30	36	c. i.	.....	.....	.....	.....	.....	.....	.....
		30	38	steel	2,154 w.i.	43,404	154,240	113,587	20,315	38,001	36,508
Watervliet	M	4	16-18-20	c. i.							
		10	20	wd. stave	2,000 w.i.	18,010	57,200	11,100	16,000	7,670	1,535
Ohio:											
Montpelier	M	.....	10	.....	.....	.....	.....	.....	.....	.....	.....
Oberlin	M	6.5	8, 10 & 12	vit. pipe	.....	4.22	7.2	1.25	.....	.....	.....
Warren	P	.....	.....	.....	13,938 w.i.	20,613	177,938	32,299	2,370	4,270	292
Oklahoma:											
Miami	M	8	8-6-4	.....	.....	4.5	1.5	2	.....	.....	.....
Oregon:						7,000	11,000	1,200	.....	.....	2,000
McMinnville	M	2¼	14	wd. stave	.....	8,400	5,000 wd.	4,000 st.	.....	.....	.....
Pennsylvania:											
Harrisburg	M	9,875	30	c. i.	.....	17,014	350,131	49,733	24,741	32,312	22,941
West Newton	P	800	10	c. i.	1 w.i.	7,500	15,200	4,100	820	.....	.....
Texas:											
Orange	P	.....	.....	.....	2,500	35,000	2,000	6,000	4,000	.....	.....
Sulphur Springs	M	.....	.....	.....	4,000 w.i.	33,250	6,700	7,850	.....	.....	.....
Terrell	M	3,000	12	c. i.	6,000 w.i.	13,800	3,000	4,500	.....	.....	.....
						2,800 w.i.	5,000 w.i.	.....	.....	.....	.....
Waco	M	.....	20	.....	115 miles cast iron, all sizes			.....	.....	.....	.....
Virginia:							1 wd	½ wd.	.....	.....	.....
Winchester	M	7,000	10	c. i.	21 miles, 4, 6 and 8-in. c. i. pipe.				.....	.....	.....
Washington:											
Spokane	M	66,682	24	steel	.....	4,651	249,200	29,016	38,486	32,189	31,135
		21,076	28	steel	.....	16,280 wd.	175,839 wd.	5,961 wd.	.....	.....	32,307 st.
		64,094	30	steel	.....	37,836	830,173	85,012	54,704	81,368	4,265 wd
							Kalam'n	Kalam'n	Kalam'n	Kalam'n	Kalam'n
Wisconsin:											
Monroe	M	.....	.....	.....	.....	27,600	16,400	6,100	.....	2,700	.....
Wyoming:											
Laramie	M	15,120	16	c. i.	3,000 w. i.	27,000	19,000	800	2,200	3,600	3,000
		16,604	14	c. i.	.....	.....	.....	.....	.....	.....	.....

extraordinary labor conditions. During 1916, 185.6 miles of country roads were given bituminous surface treatment, and 116.5 miles were treated with dust-laying oil.

THE COUNCIL OF NATIONAL DEFENCE

Composition of Council and of Advisory Commission, Boards and Committees Under Each—Some of the Work Accomplished.

Much is read on all sides concerning the Council of National Defense, but the newspapers have confined themselves almost exclusively to the more picturesque features of its activities, and have failed almost entirely to present in any exact way a description of its composition, the committees through which it works, and the relation of these to each other and to other organizations working with it. The secretary of the commission, Grosvenor B. Clarkson, has therefore asked the business and technical press to give this information in order that the people may be the better enabled to appreciate the work that it is doing and how they can themselves assist.

The council itself consists of the six Secretaries of War, Navy, Interior, Agriculture, Commerce, and Labor. Acting with, under, and by authority of the Council is an Advisory Commission of seven—Daniel Willard, Howard E. Coffin, Hollis Godfrey, Julius Rosenwald, Bernard M. Baruch, Samuel Gompers and Franklin H. Martin. W. S. Gifford is Director of the Council and Advisory Commission, and Grosvenor B. Clarkson is Secretary of both.

Under each there have been created various boards, sections and committees. Under the Council are Boards of General Munitions, Munitions Standards, Aircraft Production, and Commercial Economy; a Medical Section and Section on Co-operation with States; Committees on Inventions, Shipping, Women's Defense Work, Coal Production, the Interdepartmental Advisory Committee, and Co-operative Committees on Purchase of Army Supplies (U. S. Chamber of Commerce); also the National Research Council.

There are seven committees of the Advisory Commission, those on Transportation and Communication, Mr. Millard; Munitions, Mr. Coffin; Engineering and Education, Dr. Godfrey; Supplies, Mr. Rosenwald; Raw

TABLE NO. 3—CONNECTIONS AND APPURTENANCES.

	Fire hydrants	For filling watering carts	Gate valves.	Service connections.	Meters	Motors and elevators supplied	Private Fire Connections: Number	Private Fire Connections: Size of taps	Private Fire Connections: Kind of meter
Arkansas:									
Hope	129	1	73	1,100	900	.....	3	2, 3 & 6	.....
California:									
Los Angeles	5,727	.....	9,278	105,280	85,260	.....	230	1½ to 8	none
Colorado:									
Lamar	27	None	110	630	510	none	none	.....	none
Connecticut:									
Ansonia	94	.....	.....	1,138	535	1	8	4 to 8	Hersey Detector & Protectus
Illinois:									
Chester	39	None	6	150	4	1	3	2	none
Lewistown	41	None	26	.....	300	4	none	.....	.....
Lincoln	207	.....	116	1,725	706	.....	37	2-4	none
Iowa:									
Marshalltown	323	.....	487	3,317	2,435	.....	5	4	none
Kansas:									
Dodge City	86	1	31	1,180	700	none	5	1½ to 3	none
Kentucky:									
Morganfield	80	None	120	250	100	none	none	.....	none
Maine:									
Farmington	49	5	90	475	2	3	5	3-4	none
Maryland:									
Baltimore	3,850	None	No record	135,000	4,500	25	No record	3. 4 & 6	none
Massachusetts:									
Dalton	110	.....	60	911	none	4	2	2-4	.....
Danvers	309	12	580	2,529	35	.....	14	4-6	Detector
Falmouth	232	4	.....	1,400	25	.....	.....	¾-1	Hersey Detector
Woburn	437	19	699	3,355	756	10	15	1-6	none
Michigan:									
Detroit	7,064	.....	11,069	132,030	46,991	.....	.....	2-12	none
Minnesota:									
Ely	50	4	.....	.....	76	none	1	2	.....
Minneapolis	5,627	.....	587	60,000	58,000	.....	.....	.....	.....
Moorhead	147	2	84	600	600	.....	.....	.....	.....
Nebraska:									
Aurora	.....	2	.....	700	700	.....	.....	.....	.....
Fairbury	30	2	30	1,000	1,000	none	3	2	.....
New Hampshire:									
Lancaster	66	None	90	500	1	1	none	.....	.....
Pembroke	62	None	16	300	none	none	1	6	none
New York:									
Canastota	90	2	60	650	618	.....	5	2-4-6	.....
Oneida	143	None	263	1,300	1,280	3	9	4	none
Oswego	490	.....	340	5,000	250	2	30	4 to 12	none
Rochester	5,589	None	9,358	46,100	48,400	.....	480	4-8	Hersey Detector
Watervliet	170	3	175	3,000	50	none	10	4-6	none
Ohio:									
Montpelier	84	3	.....	840	450	.....	4	1½	none
Oberlin	117	1	82	1,069	947	none	5	2-4	none
Warren	253	None	.....	5,270	4,054	none	.....	2	.....
Oklahoma:									
Miami	79	2	24	1,462	1,462	none	22	2	none
Oregon:									
McMinnville	64	2	88	868	204	none	17	2	.....
Pennsylvania:									
Harrisburg	1,112	.....	2,266	18,794	12,890	7	.....	6	none
West Newton	52	None	68	500	275	2	2	2-6	Hersey Detector
Texas:									
Orange	48	2	14	600	565	.....	4	2	none
Sulphur Springs	100	1	36	1,000	400	none	3	4	National
Terrell	85	None	107	812	749	none	none	.....	none
Waco	525	.....	700	9,500	5,250	none	25	6	none
Virginia:									
Winchester	110	.....	35	1,800	10	.....	4	3-6	.....
Washington:									
Spokane	2,230	83	2,822	25,821	16,229	.....	74	4-6	none
Wisconsin:									
Monroe	116	.....	6	724	642	2	1	6	none
Wyoming:									
Laramie	55	.....	45	1,300	none	none	6	2	none

Materials, Mr. Baruch; Labor, Mr. Gompers; and Medicine and Surgery, Dr. Martin.

Each of these committees has co-operative committees, there being 37 of these in all, as follows: With the Transportation and Communication Committee, Committees on Telegraphs and Telephones, Railroads, and Electric Railroads. With the Munitions Committee, Committees on Automotive Transport, and Public Utilities. With the Supplies Committee, Committees on Cotton Goods, Woolen Goods, Knit Goods, and Shoes and Leather. With the Raw Materials Committees, Committees on Alcohol, on Aluminum, on Asbestos, Magnesia and Roofing, on Brass, Cement, Chemicals, Coal Tar By-Products, Lead, Lumber, Mica, Nickel, Oil, Rubber, Steel and Steel Products, Sulphur, Wool, and Zinc. With the Labor Committee, Committees on Wages and Hours, Mediation and Conciliation, Welfare Work, Women in Industry, Information and Statistics, Press, Publicity, and Cost of Living. With the Medicine and Surgery Committee, a Committee on Standarization, and a General Medical Board.

The works of the Council of National Defense is carried on largely through the assistance of civilians who serve without pay. In the service of both Council and Advisory Commission there are but eighty paid employees, most of them clerks and stenographers. Of the non-salaried civilians there are more than one hundred highly trained men from many fields of industry and science who are giving their entire time without any compensation and in addition are paying their own living expenses in Washington; while several hundred others give a large part of their time in different ways and places.

The Council, although created by Act of Congress of August 29, 1916, was not fully organized for business until March 1. It was charged, among other things, with the "coordination of industries and resources for the national security and welfare" and the "creation of relations which will render possible in the time of need the immediate concentration and utilization of the resources of the nation."

The following are a few of the accomplishments of the Council, some of which have been given wide publicity but others of which have not:

The mobilization of the 262,000 miles of railroads of the country for the Government's defense;

The close-knit organization of the telephone and telegraph companies of America to insure to the Government the most rapid and efficient wire communications;

The settlement of the recent threatened national railroad strikes;

The very general acceptance by labor and capital of the suggestion of the Council that existing labor standards should not be changed until the need for such action had been determined by the Council with the steadying influence on industry growing out of such action;

The procurement of 45,000,000 pounds of copper for the uses of the Army and Navy of the United States at less than one-half of the then current market price—a saving to the Government of approximately $10,000,000.

Similar accomplishments as to steel, zinc and aluminum.

The completion of the inventory, for military purposes, of 27,000 American manufacturing plants;

The money saving to the Government, through appointment over the country of committees of business men to assist the quartermasters' department of the Army in the economical and efficient purchase of supplies;

The saving to the Government of millions of dollars by the proper co-ordination of purchases through the agency of the General Munitions Board of the Council of National Defense;

The creation, under the medical section of the Council, of a General Medical Board, consisting of many of the most highly qualified surgeons and physicians of the country;

The selection by the same section of thousands of doctors specifically qualified for membership in the medical officers' reserve corps, and the standardization, far on its way to completion, of surgical instruments and supplies;

The creation by the Council of the Aircraft Production Board, which is setting out to make 3,500 air planes and to train 6,000 aviators this year;

The very definite results obtained by the Council's Committee on Coal Production in the procurement and expeditious shipment of coal, both in the civilian and federal interests;

The successful initiation of a movement to co-ordinate activities on the part of the States of the Union for the national defense, brought to a clear and workable focus by the conference of states held recently in Washington at the call and under the auspices of the Council;

The organization of a Railroad Committee to send to Russia; and

The enlistment of reserve engineer regiments to aid in rehabilitating the railroads of France.

UTILIZING WASTE CANS.

The municipality of Hornsey, England, under the direction of the borough engineer, E. J. Lovegrove, has devised a method of utilizing the tin cans in the refuse brought to the refuse destructor, by desoldering and baling the tin. This itself is not new, but the novel feature consists in utilizing the heat of the flue gases for melting the solder and tin. Hornsey already had a hydraulic press for baling the tin, and the additional capital outlay was only about $1,000.

The amount of tin cans received averages about 1.35 tons per year per thousand population; while there is 0.65 ton additional of light tin scrap, galvanized and enameled steel. For a small community Mr. Lovegrove knows of no commercially practicable method of recovering the tin, but the tin and solder are removed by heat, the solder being collected in a trough and the dross removed from it. The melting is performed by dropping the cans, when sorted out from the refuse, into a furnace through which are passed the fuel gases from the destructor on their way to the chimney. The cans are then removed and put into a hydraulic press and compressed into bales about 2 ft. 3 in. by 15 in. by 4 in. deep. When removed, no banding is necessary, as the bales hold together and can be loaded directly into a truck for delivery to the steel works.

The light scrap is sorted out and baled without treatment and sent to the steel works. The galvanized scrap is baled without treatment and delivered to degalvanizing works. The enameled scrap has to be specially treated by firms dealing in that material, who remove the enamel and recover the steel. Both solder and steel scrap find a ready sale, and produce a revenue in the Hornsey district of more than $1,000, "thus doing away with the necessity of paying for the cartage of material to waste tips, which still obtains in many districts. The plant at Hornsey, by the adoption of the above-mentioned furnace in connection with the destructor plant, has rendered possible the carrying out of the work as part of the depot routine, no additional labor having been employed." Where a destructor is not available, flue gases from any furnace, boiler or other plant can be used for melting the solder.

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COST OF PUBLIC WORK.

Our pleas for continuation of public work have drawn out communications from two or three officials to the effect that the cost of such work has increased so greatly as to discourage all work except that absolutely necessary. We have been at some pains to learn just what increase is necessary owing to higher prices, taking concrete as typical and as entering into many kinds of work.

For one thing, it appears to be indicated that some contractors are taking advantage of conditions to endeavor to obtain more than a fair profit, just as many dealers in food are doing. For example, in a city near New York a few days ago, one contractor asked 95 cents a lineal foot for concrete curb 6 and 8 by 17 inches on a broken stone foundation, while another took the contract for 40 cents. The latter is perhaps too low to leave much profit, but the higher price was exorbitant. Another city near New York on June 7th let three contracts for curb at 40 cts., 56 cts. and 58 cts. respectively to three different contractors, and one for cement sidewalk at 17 cts. a square foot.

Cement is now selling at $1.60 per barrel net at the mill, as against $1.30 to $1.35 last year. Sand and stone cost the same as last year in this vicinity, and gravel costs 35 cts. a cubic yard more. Labor has advanced from $2.00 to $2.50 per day. In the case of concrete roads this would amount to an increased cost per square yard of 9 to 11 cents for cement, nothing for sand and stone, and 10 cts. for labor, or 19 to 21 cts. additional per square yard. For 6-inch concrete base for pavement, the increase would be less than this or about 6 cts. for cement and 7 cts. for labor, or a total of 13 cts. These take no account of the cost of grading, which would be increased about 25 per cent if performed entirely by hand labor.

These figures show about the same increase—20 per cent—as that estimated by the State Highway Department of Pennsylvania in figuring on work for this year. In other lines the increase is still less, this being the case with bituminous paving materials, we believe. This amount is by no means negligible, of course, but scores of cases can be cited from previous years where bids on a given contract have varied considerably more than 20 per cent, this amount having been saved to the city by wide publicity that has secured the bids of a large number of contractors. By wise advertising, and lenience as to time for finishing the work to allow for possible scarcity of labor, we believe that it will be possible to obtain as low prices as were obtained in previous years by those cities that paid less attention to these matters. An encouraging feature is the fact that many contractors, because of scarcity of labor, have developed various methods of reducing labor costs by the use of mechanical appliances. Some, for instance, have entirely eliminated the wheelbarrow gangs for supplying sand and stone to concrete mixers. We expect to describe a number of these labor-saving schemes in future issues.

IMPORTANCE OF PROPER USE OF MATERIALS.

An illustration of the importance of apparently minor details in determining the success or failure of engineering work is given by an article in this issue. In this case the presence on a pipe of a mere smear of cement from a grout-soaked packing apparently prevented the adhesion to the pipe of a bituminous jointing material and caused joints to leak that otherwise would probably have been satisfactorily tight. An effort had been made to wipe the pipe clean before running in the hot jointing material, but apparently the damage was done by an amount of cement so small as to escape observation. Had not the engineers taken pains to learn the cause of the numerous leaking joints, the blame for them might have been placed on the jointing material instead of on a method of using it that proved to be inadvisable.

Undoubtedly many failures, partial or entire, of materials used in many kinds of municipal work are due to an improper or ill-advised use of such materials. Defective concrete is probably due to the cement less than one per cent of the time, a large percentage of the failures being due to improper aggregates, and a still larger number to improper methods in mixing. The use of one of several grades of road oil where or in the manner in which another should have been used, or in an otherwise improper way, has been the cause of numerous complaints against materials for unsatisfactoriness for which the carelessness or ignorance of the users (either engineer or laborers) was really to blame.

A. S. M. I. CONVENTION POSTPONED.

Last week the Executive Committee of the American Society of Municipal Improvements voted to postpone for about a year the annual convention of the society, which it had been intended to hold at New Orleans on November 12th to 16th of this year. This action was taken because of the war, so many members of the society having enlisted that there was doubt whether a successful turnout could be obtained, especially since the absence of these would throw so much responsibility upon those remaining in charge of the municipal work that even of these only a few might feel at liberty to leave home for the convention.

The WEEK'S NEWS

State Highway Work in Texas, Illinois and Maine—Health Activities in Milwaukee—Water Waste Elimination in Spokane—Chicago Changes Gas Rates and Standards—New York Gets Reduced Electric Rate—Police Survey of Harrisburg—Indianapolis Police Chief Convicted—Finances of American Cities—New Jersey Plans Civil Service Reform—Dallas Raises Employes' Salaries—Tunnel Plans for New York and New Jersey—Rapid Transit in Chicago and Cleveland—Builders of the Army Cities—Springfield, Mass., Sets Clock Ahead.

ROADS AND PAVEMENTS

Economy of Good Roads.

San Antonio, Tex.—That the saving on gasoline, oil and tires for automobilists alone, as a result of improved roads will, in a year's time, more than pay for the road is an interesting statement by D. E. Colp, secretary of the Texas Good Roads Association and Bexar County Highway League, supported by actual figures. For a basis the Post Road from San Antonio to Austin was taken and actual count showed that during February an average of 931 cars passed over the road daily, which means 335,160 for a year. Before the road was improved it required an average of eight gallons of gas for the trip and this has been reduced to five gallons, a saving of three gallons per car. This in a year's time for the 335,160 cars, at 22c. per gallon on the 1,006,380 gallons used, means $221,403.60. The estimated saving on oil is $20,000 and on tires $127,000, bringing the total to $368,403.60 saving on these three items alone. The total cost of building the road was but $239,800, which means that the saving for one year was $128,603.60 more than the cost of the road. These figures are considered especially pertinent just now with the State Highway Department formed and the state law requiring a minimum license fee of $7.50 on automobiles effective July 1. It is estimated that this fee will bring into the highway fund approximately $1,360,000 annually, one-half of which is returned to counties from which it came to be used for road maintenance, while all the balance, aside from about 8 per cent. necessary for administrative purposes, also will be used for road construction and maintenance. The 8 per cent. pays the salaries for engineering supervision and buys the number plates, the commissioners not receiving a salary. To this may be added the $4,515,750 appropriated by the Federal government for Texas roads for the five years ending 1921, nearly $1,000,000 of which already is available as soon as this state qualifies for it.

Highway Funds of Illinois.

Springfield, Ill.—The state will have $7,399,958 to expend for the two years commencing July 1, 1917, for the construction of good roads, or over forty per cent. more than it had for the two previous years. The fiftieth general assembly has appropriated $3,699,979 for the purpose of building roads, to be paid out of the automobile license fund, and the Federal government appropriates an equal amount, making a total of $7,399,958, against a total of $5,200,000 for the two preceding years. With seven million dollars from the state and federal government and with the counties appropriating a like sum there will be fourteen and one-half million dollars for building good roads in the state for the next two years. Secretary S. E. Bradt of the state highway commission, who is to be superintendent of highways in the department of public works after July 1 has made the following statement: "The appropriations made by the Fiftieth General Assembly for road improvement, are as follows: Unexpended balance, $1,173,979.00; to meet federal allotment, $1,326,000.00; for state aid work, $1,200,000; total $3,699,979. Amount appropriated and to be appropriated by federal government and the counties of Illinois, $3,699,979. Total available for expenditures for road improvement in Illinois during 1917 and 1918, $7,399,959. Appropriation by forty-ninth general assembly for road improvement—Unexpected balance, $600,000; state aid roads, $2,000,000; total, $2,600,000. Excess appropriation in 1917 over 1915, $1,099,979. It was not deemed wise to appropriate at this time any further sums for road improvement because of the high price of material and labor, as well as the scarcity of labor and the possible inability of contractors to obtain material owing to the shortage of cars in which to ship such material. It is understood, however, that in the event conditions are such as to allow the expenditure of a reasonable proportion of the amount appropriated as above for state aid work by September, 1918, that county boards will then be advised to provide funds by levy to meet an additional allotment to be made available by the fifty-first general assembly on April 1, 1919, through an emergency appropriation of $1,000,000. The entire amount appropriated for road improvement aggregating $3,699,979 will be paid out of the fund derived from motor license fees, which have been collected for that purpose only—hence these appropriations in no way add to the general taxes of the state. The new motor law provides for the following rates to take effect on January 1, 1918, and January 1, 1920:

10 h. p. and less—1917, $3.00; 1918, $4,50; 1920, $6.00.
25 h. p. and more than 10—1917, $4.00; 1918, $6.00; 1920, $8.00.
35 h. p. and more than 25—1917, $6.00; 1918, $9.00; 1920, $12.00.
50 h. p. and more than 35—1917, $8.00; 1918, $16.00; 1920, $25.00.
More than 50 h. p.—1917, $10.00; 1918, $20.00; 1920, $25.00.
Motorcycles—1917, $2.00; 1918, $3.00; 1920, $4.00.
Electric vehicles to and including 2 tons—1917, $5.00; 1918, $10.00; 1920, $12.00.
Electric vehicles over 2 tons—1917, $10.00; 1918, $20.00; 1920, $25.00

"This law further provides that the fund thus created known as the "road fund" can be used only for two purposes: First—For the payment of the principal and interest of any bonded indebtedness incurred by the state of Illinois for road construction and second, for the improvement of the highways of the state. It will thus be seen that both purposes are primarily for the improvement of our roads and that this money constitutes a special fund paid in and set aside for that specific purpose."

Work of Maine Road Commission.

Augusta, Me.—During the past year the commission has been asked to make but few changes in the location of the designated state aid roads, but probably not less than one hundred requests have been made by municipal officers for changes in the location of work from one part of the designated state aid road to another part of the same road, according to the annual report of the members of the state highway commission, Philip J. Deering of Portland, William M. Ayer of Oakland and Frank A. Peabody, filed with the governor. The commission renews its recommendation made one year ago that for all towns located upon the state highway system at least, the traveling public will be convenienced in far greater numbers and the town will relieve itself of the burden of maintenance by the continuous expenditure of the state aid joint fund upon the state highway until the highway is completed. During the past year the first attempt at patrol maintenance on any extensive scale was undertaken. Under the laws of 1915, 3,379 miles of road located in 423 towns were under constant daily care of 373 patrolmen. Patrol work started about April 15, and continued until the first of November. Substantially $275,000 was expended on this work. "As must be expected with the undertaking of any new method for doing work there was more or less objection on the part of the municipal officers and there has been more or

less criticism of the work done by patrolmen," says the report. The objection of the municipal officers to having patrol maintenance organized has generally shown itself to be on account of concentrating this work in the hands of one man and consequently not being able to employ a considerable number of voters for longer or shorter periods, when no other form of employment was in sight. The commission thoroughly believes that for the most part patrol maintenance has been successful. The commission has received comments to this effect from many people who have measured their judgment solely by results obtained on the roads. Many of the most interested supporters of the good roads movement have suggested that patrol maintenance ought to be extended to cover all of the main thoroughfares in every town. Under the recent Shackleford legislation, the state of Maine can draw federal aid for the highways for the coming four years, as follows: 1917, $97,500; 1918, $146,250; 1919, $195,000; 1920, $243,750.

SEWERAGE AND SANITATION

Health Commissioner Recommends Improvements.

Milwaukee, Wis.—Several changes in the various divisions of the health department are suggested by commissioner George C. Ruhland in his annual report submitted to the common council. Among the chief recommendations are: The immediate engagement of experts to study the special needs of a filtration system for Milwaukee, considered necessary to finally solve the city water problems. Organization and conduct of all medical inspection of schools, public as well as private, under single authority of the health department, for economy and much needed efficiency; a district nursing plan. The extension of health publicity and propaganda funds to meet the increasing needs for public health education. The establishment of a municipal hospital, preferably in combination with a relocated emergency hospital. More adequate quarters for the health department to remedy the present inadequacy. Equal representation on the board of estimates with other city departments. The licensing of lodging and boarding houses to advance the ultimate solution of the housing problem; consideration for municipal lodging houses. Abandonment of day camps in child welfare work and enlargement of the fresh air pavilion. Completion of equipment for the preventorium for children. In the division of food inspection, commissioner Ruhland recommends a proper inspection law to eliminate diseased and unwholesome meat from the market; guard the water supply on farms supplying milk to Milwaukee; keepers of food establishments should require employees to furnish health certificates; decided improvements in handling foods during transportation. In his report on the division of communicable diseases, the commissioner recommends a more efficient plan to control the spread of diseases through the schools. The report also recommends that chicken-pox be placed under control and placarded.

Auto Theater for Health Education.

New Orleans, La.—The Capital City Auto Company has turned over to the State Board of Health a Studebaker car equipped to be used throughout the state for exhibiting motion pictures for health educative purposes. In accepting it for the Board Dr. Oscar Dowling gave the machine a try-out and pronounced his experiment successful. The car is to have a large part in a forthcoming health campaign. The machine will be called "The State Board of Health Theater on Wheels," and will make its maiden tour to Baton Rouge. It will be fitted with a film projector, and other necessary equipment, and promises to appeal to the children of the rural districts, many of whom never or seldom have the opportunity to see the motion pictures.

Industrial By-Products of Sewage in England.

Bradford, England.—The sewage works of the city of Bradford recover the grease turned into the sewers by many of the wool washing and scouring establishments and thereby convert into a highly profitable by-product a waste effluent formerly difficult and costly to dispose of. The sales of this recovered grease amounted in 1916 to £80,000 ($389,320), an increase of £19,000 ($92,463) over 1915, owing to the high price now obtainable, which is about £25 ($122) per ton; and it is estimated that in 1917 £70,000 ($340,655) will be derived from that source, in addition to £5,000 ($24,332) from the sale of manure or fertilizer made from the sludge after the grease has been extracted. The municipal expense of maintaining the sewerage department has steadily declined in recent years, and it is believed that the enterprise will be self-supporting in 1917. Samples of the grease and manure were anlyzed by government experts, who report that the grease is of great value to the leather-dressing trade and to certain branches of the textile industries. The whole of the waste effluent is not treated for grease recovery because the plant is not adequate; the government urges an increased output.

WATER SUPPLY

Big Saving Follows Water Waste Survey.

Spokane, Wash.—Nearly one and a half billion gallons of water were saved by leak stoppage last year, according to the annual report of engineer L. O. Chambers of the waste survey of the water division. The net saving, says the report, works out at an average of 3,877,000 gallons every 24 hours. In all 2,416 leaks, each with a daily average waste of 1,760 gallons, were plugged. Total water pumpage for 1916 amounted to 8,613,762,000 gallons, according to the water division's annual report. The total pumpage is less than for any year since 1912, and the drop is largely due to the stoppage of leaks. The monthly average pumping in 1913 was 1,136,000,000 gallons; in 1914 it dropped to 926,000,000; the 1915 figure was 768,000,000, and last year another drop to 718,000,000 gallons was experienced. The division now has 576 miles of pipe in service in the city, of which 357 miles are in the distribution system, the balance being used for private services.

City Sued for Hydrant Rent.

Livingston, Mont.—The city of Livingston has been made defendant in a suit in which the Livingston Water Co. seeks to recover $45,350 alleged to be due for hydrant rental. The city and water company became involved in a dispute in 1912 over the hydrant rental, the city offering $35 per month for each hydrant in the town, while the company demanded $100 per hydrant, as provided in the original contract between the water company and the city. Mayor Veit stated, after the filing of the suit, that the supreme court of this state has ruled that the company has no contract with the city, and therefore cannot hold the city to the contract price for hydrant rental.

Raise Rates for Large Consumers.

Flint, Mich.—Announcement that the cost of supplying water at the filtration plant has increased so that it has been necessary to increase the rate for big consumers from five cents per gallon to eight cents per gallon minimum for water consumed above 75,000 gallons per month, has been made by F. N. Baldwin, waterworks superintendent. Action increasing the rates of the large consumers, but not in any way affecting the small consumers, has been taken by the water board which says that it is impossible to furnish water in any quantities at the present minimum rate of five cents per thousand gallons without a serious loss to the waterworks and that all water furnished to consumers at said five cent rate is furnished at an actual loss. Beginning with the July, 1917, bills the water will be sold by cubic feet and the present minimum rate of five cents per 1,000 gallons for amounts in excess of 75,000 gallons in any one month will be raised to eight cents per 1,000 gallons. All other rates will remain as at present or as near as can be figured in cubic feet instead of gallons without using fractions of cents, allowing seven and one-half gallons per cubic foot.

STREET LIGHTING AND POWER

New Rates and Standard for Chicago Gas.

Chicago, Ill.—Passage of the new gate rate ordinance by the city council has paved the way for the expenditure of millions of dollars by the Peoples Gas Light and Coke Company in the complete rebuilding of its plants. The ordinance was said to be one of the most important the council has passed in years. The following is the cost per thousand feet of gas under the new ordinance with the sliding rate scale approved by the council: 1,000, 75½ cents; 1,500, 73⅜ cents; 2,000, 72¼ cents; 2,500, 72 1/5 cents; 3,000, 71 5/6 cents; 4,000, 71⅜ cents; 5,000, 71 1/10 cents; 10,000, 70½ cents. The average consumer in Chicago uses 2,500 cubic feet of gas per month. His bill is $2 under the present ordinance. Under the new rate his bill will be $1.80. The new gas ordinance is declared by its advocates to mark the beginning of a new era in the relations of the Peoples Gas Light and Coke Company with its consumers and the city of Chicago. There will be no court fight, as the ordinance is acceptable to the company. A flat rate is eliminated—a new precedent for Chicago. The sliding scale rate will permit the company to sell gas by wholesale as well as by retail quantities. The most important feature of the ordinance, aside from the rates to be charged, is the changing of the standard from a candlepower requirement to a heat unit basis, which was the object of a strong newspaper campaign by the company. This will enable the company to manufacture coke oven gas, and one of the provisions of the ordinance is a requirement that the company begin construction of its new plant within ninety days and that it must be ready within three years to furnish 8,000,000,000 cubic feet of gas a year. The new plant, the company estimates, will cost $10,000,000. The profit sharing for consumers provision is a new feature of public utility rate ordinances in Chicago. The company is to be required to divide with its consumers all net earnings in excess of $4,000,000 a year. The company shall retain 75 per cent of the earnings between $4,000,000 and $4,500,000 and refund the remaining 25 per cent to its consumers. All profits in excess of $4,500,000 shall be split "fifty-fifty" between the company and its consumers. The ordinance, instead of fixing rates and standards for a five-year period, as has been customary under the city's enabling act, really is only effective for twelve months. At the end of a year it is figured that the period of readjustment to the new method of manufacture and the new standard of gas will be over and changes may be made.

Another Electric Rate Reduction for New York.

New York, N. Y.—The New York Edison Company has reduced its maximum rate for electricity to seven cents per kilowatt hour, taking effect July 1. A letter to the Public Service Commission stated that the company would accept the reduction directed by the commission. The action of the commission informing the company that it must put the lower rate into effect followed hearings before the commission in which the company attempted to establish that a reduction from 7½ cents to 7 cents on July 1 would be unwarranted. The commission, however, held that the company had not shown sufficient cause to warrant a maintenance of the 7½-cent rate which was fixed last November and has been in effect since January 1. The new rate will continue for at least six months. On December 3 the company must appear before the Public Service Commission again and state where it intends to return to the 8-cent rate in force prior to January 1, 1917, or continue with the 7-cent rate until new conditions arise. The last fiscal year that the 8-cent rate was charged the company earned $5,800,000 net. At the rate the company is now doing business its net earnings for the current year have been estimated at about $7,000,000. It was estimated that the company would probably find itself compelled to charge not more than 6 cents next year either under an order of the commission based on the net earnings of the company or through the enactment of a law fixing the rate at that figure. The reduction from the 8-cent rate represents a saving for the consumers of about $1,750,000 for the current year. Chairman Straus of the commission asked city chamberlain Maltbie, who represented the mayor, to express an opinion. "The company," said Mr. Maltbie, "having reserved the right to restore the old rate of 8 cents at the end of the year, I presume the city should reserve the right to demand that it be reduced to 6 cents." The company filed a brief at first opposing the cut on the grounds of increasing operating costs. At the hearings before the commission it was brought out that the company is about $60,000,000 ahead of its expenditures, and can go on piling up money at the present rate. It was shown that in the fiscal years of 1907, 1908 and 1909 the company paid 6 per cent on $45,000,000 of stock; that the same rate was paid in 1910 on $49,000,000, from 1911 to 1913 inclusive on $50,000,000, and in 1914 on $66,000,000. On this latter amount 6¾ per cent was paid in 1915 and 7 per cent in 1916. Besides paying these increasing dividends on increasing stock values the company increased its corporate surplus from $10,000,000 to $36,000,000, increased its contingency reserve to $22,000,000, and paid interest of about $2,500,000 a year on its bond issue of about $39,000,000. It is possible that the commission may make an appraisal of the company's property, a task which will take about a year, but which will serve to adjust rates on a solid foundation. During 1916, while the 8-cent rate was being charged, the company, it was said, earned $5,800,000 net, and it could reduce the present rate to 7 cents and earn $7,000,000, the difference representing the increase in business. Estimates made of the value of the company's property by public officials ranges from $70,000,000 to $85,000,000. H. M. Edwards, the company's auditor, presented figures showing that the cost of operation of the company's plant in 1917 would be $19,029,200, $4,016,024 more than in 1916. Mr. Ransom, counsel for the commission, brought out the fact that the 10 per cent increase in wages included the 7 per cent bonus given to the employes, so that the real net increase was only 3 per cent. It was also disclosed that the company had estimated its income on the basis of a 7 per cent charge, that coal was figured at the rate of $7 a ton, and that the receipts from the Third Avenue Railway Company appeared in the report as $695,573. Figures submitted by the Third Avenue Company made the total $300,000 more. It also came out that some of the charges current were based on the cost of coal so that the cost of power went up with the price of coal. Mr. Ransom thought that the Edison Company charged against operating expenses $1,665,263 too much. It also appeared that the company had loaned about $4,000,000 at 3½ per cent interest, and that it was paying 6 per cent on about $3,500,000 which it owed to the Consolidated Gas Company. Mr. Ransom thought it would have been wiser if the company had paid its debtor from the money due it from its creditor.

Light Rate Increased.

Montpelier, O.—Owing to the extremely high price of fuel the Board of Trustees of Public Affairs has been forced to increase the rates for light current to 12 cents per k. w. hour. The expense for fuel so far in 1917 has been in excess of the fuel cost for the entire year of 1916. The former rate was 10 cents.

FIRE AND POLICE

Report Follows Police Survey.

Harrisburg, Pa.—Take the police out of politics, is the gist of the report of Clement J. Driscoll, the expert of the Bureau of Municipal Research of New York, who was employed by the Chamber of Commerce to make a survey of police conditions in Harrisburg. His suggestions, embodied in a report of ten thousand words, created a decided stir among officers and men of the force. Driscoll also recommends that the chief of police by appointed by civil service code, and not by political preference. He decries the wholesale removals upon the coming into office of every new mayor and says that officers who owe their appointment to political preferment have nothing to look forward to but dismissal. The report lays bare the vice conditions of

Harrisburg in frankest fashion, saying: "The statutes prohibit and the police and constables are required under the law to use every effort to suppress prostitution and gambling. This fact is well known, not only by the officials of the community, but by the general public as well. Dealing solely with the municipal police force, it may be said that the officials in charge of the police bureau have adopted a policy of 'toleration.' By this policy of police 'toleration' is meant permitting commercialized prostitution in certain parts of the city, without police interference or prosecution. Because the statutes prohibit prostitution and because the responsibility for its suppression is by law placed with the police, the bureau keeps no records indicating the location of premises suspected as being operated as disorderly places. While no moral survey of the city was conducted and no effort made to study the vice conditions in detail, except in the degree necessary to determine the policy of the police bureau and the effort made to comply with that policy, a tour of observation showed that assignation hotels and houses of prostitution operate openly and without fear of police interference. It may be true that the commercialized houses of prostitution are confined to a definite section, but commercialized prostitutes are also operating flats, apartments and rooming houses and soliciting upon the main streets of the city. Notwithstanding these conditions, which are known to almost every well-informed official, and indeed to a large number of citizens of the city, every three months regularly members of police force attended a session of the court of quarter sessions and present to the judge of that court over their signatures sworn statements that they have no knowledge of the existence of any tippling and disorderly houses. It is interesting to note that for the filing of this quarterly report, which in most cases contains the word 'none' in reply to each of the 24 questions asked, $2.50 is paid by the county to the officer reporting." On behalf of the men he recommended that the city pay for their uniforms and revolvers. As it is, the city supplies only badge, whistle and nippers. It costs a policeman about $75 a year for uniforms. He considered that at least twenty more men were needed on the force. The principal recommendations made for the improvement of the service follow:

Civil service for police force and chief of police.
Substitution of a police magistrate's court for mayor's hearings and the turning over to this magistrate of all criminal work now done in the alderman's courts.
No toleration by the police department of prostitution and gambling. Police officials to be directed to begin a vigorous campaign against vice conditions which exist in the city. Administration to adopt a policy of suppression.
Better care of outlying and business sections with bicycle and motorcycle patrol with suburban booths like those in New York.
Ages of police at time of appointment between 21 and 30, with average of 25.
Detectives to be chosen from uniformed force and to serve only so long as work is satisfactory.
A court for women with matron in charge; hearing of juveniles out of court.
Revision of traffic regulations with suggestion of sending officers to New York to study conditions there.
Better lighting of stores in business district at night.
Suitable court room for police hearings in keeping with dignity of city.
Introduction of modern record system.

Civil Service for Police.

Harrisburg, Pa.—Police officials in the third class cities in the state are gratified at the passage by the legislature and the signature by the governor of a bill providing for civil service in police departments in cities of that class. Political control of the departments has been responsible for inefficient and handicapped work. Despite opposition from politicians the measure passed when they were off their guard.

Police Chief Guilty of Election Frauds.

Indianapolis, Ind.—Samuel V. Perrott, chief of the Indianapolis police, and five others were found guilty of a conspiracy to commit election frauds in connection with the 1914 registration and election by the verdict of a jury in the United States District Court here. The others convicted were Roy A. Pope, police captain; Wayland Sanders and Morton C. Hulse, police sergeants; Lee Stringer, city detective, and Herman F. Adam, city inspector of weights and measures. A seventh defendant, Frank M. Johnson, a patrolman, was acquitted. Seven others indicted pleaded guilty some time ago. The jury's verdict was reached after three hours of deliberation. The indictment charged violation of Section 19 of the Federal Penal Code, which provides imprisonment and fine for participants in a conspiracy to injure persons in the exercise of civil rights. One count of the indictment alleged the prevention of men from voting and the other charged an injury to candidates for Federal office in that a fair election was prevented by the conspiracy. The case grew out of a civil suit for damages for the alleged prevention of a negro from voting, in which the 1914 political conditions in one city precinct were exposed.

GOVERNMENT AND FINANCE

Commission-Manager Form Approved.

Sault Ste. Marie, Mich.—The city has adopted the commission-manager form of government by a majority of 527 after a hard political fight. Many of the present aldermen were strongly opposed to the new government. The new form will go into effect in about three months. The charter provides for the election of four commissioners and a mayor.

Business Man Appointed Manager.

Wheeling, W. Va.—After lengthy consideration of candidates, George O. Nagle has been appointed city manager of Wheeling. Mr. Nagle is president of the West Virginia Manufacturers' Association. The commission form of government, approved by the voters at a recent election, became effective July 1.

City Goes on Cash Basis.

Duluth, Minn.—The city of Duluth is now on a cash basis for the first time since 1911. The $100,000 bond issue authorized on April 30 by the city commissioners to wipe out the old deficit in the permanent improvement fund has gone into effect and with the taking over of the bonds into the sinking fund, the city's six-year debt was liquidated. After the transfer was made by Commissioner Voss, finance head, a statement was prepared by city auditor Campbell, showing the present status of the permanent improvement fund. The city is now on a cash basis in all its funds, while the permanent improvement fund has $33,695.47 available for street improvements or new buildings to be constructed during 1917. The bonds are in blocks of $20,000 each, maturing each year for five years, beginning in June, 1918.

Increasing Expenditures of American Cities.

Washington, D. C.—In 149 of the 213 American cities of more than 30,000 population the excess of expenditures for governmental costs, including interest and outlays for permanent improvements, over revenues during the fiscal year 1916 amounted to $86,013,326, or $3.68 per capita. In the remaining 64 cities the excess of revenues over expenditures was $12,422,256, or $1.40 per capita. Taking the entire 213 cities as a group, the excess of expenditures over revenues amounted to $73,591,070, or $2.28 per capita. The net indebtedness of these cities averaged $76.64 per capita—a figure nearly eight times as great as the corresponding one for the National Government. Eighty-nine cities, or nearly 42 per cent of the total number, are operating under the commission form of government. The foregoing are among the facts brought out in a report entitled "Financial statistics of cities having a population of over 30,000, 1916," soon to be issued by the Bureau of the Census, Department of Commerce. The aggregate revenues of the 213 cities during the year amounted to $994,710,241; the aggregate expenditures for current governmental costs, including interest, to $780,742,643; and the aggregate outlays, to $287,558,668. Of the total revenue, $695,106,895, or nearly 70 per cent, represented receipts from taxes of various kinds. The greater part of this amount, $623,300,805, was received from the general property tax, derived from assessments upon realty and personal property. The earnings of the public service enterprises of the cities of the group, mostly water supply systems, amounted in the aggregate to $99,797,175, and formed the largest source of revenue next to general

taxes. The revenues from these enterprises were considerably more than double the expenditures incurred in their operation, which aggregated $44,636,007. For all the cities taken as a group the per capita receipts from property taxes amounted to $19.74; from other taxes, $1.80; from earnings of public service enterprises, $3.09; from special assessments and special charges for outlays, $2.29, and from all other sources combined, $3.91. The highest per capita property taxes, $48.94, are shown for Brookline, Mass., and the lowest, $5.28, for Portsmouth, Va. The total expenditures of the 213 cities was $1,068,301,311. Of this the bulk, or $603,060,076, were the expenses of general city departments, including police, fire, schools, legislative, executive, etc. The sum of $287,558,668 went for outlays, $133,046,560 for interest on indebtedness; $44,636,007 for expenses for public service enterprises. The payments for governmental costs, including interest and outlays, exceeded the revenues by $73,591,070, or $2.28 per capita; but the revenues exceeded the current expenses and interest by $213,967,598, an amount equal to nearly three-fourths of the total outlays, which aggregated $287,558,668. In other words, the cities of over 30,000, taken as a group, are paying from their revenues all their current expenses and interest and nearly three-fourths of their outlays. This is a considerably better showing than was made by the 204 cities of over 30,000 during the preceding year, in which the revenues of these cities exceeded their expenditures for current expenses by $189,829,746, an amount equivalent to somewhat more than half their outlays. In sixty-four cities last year, as against forty-eight in 1915, the revenues were in excess of the entire expenditures. The net increase indebtedness during the fiscal year for all the cities taken as a group, $106,770,100, was considerably less than the corresponding increase during the preceding fiscal year in the 204 cities covered by the report for that year, which amounted to $142,731,834. These figures, as well as those for receipts and expenditures, the bulletin states, indicate a perceptible slackening in the rate at which American municipalities have been living beyond their incomes, although the practice of mortgaging the future has by no means been brought to a halt.

Civil Service Reform in New Jersey.

Trenton, N. J.—Extensive plans for the reform of the civil service in New Jersey are outlined in a statement by Dr. John D. Prince, president of the State Civil Service Commission, as reorganized under the law passed by the Legislature last winter. Dr. Prince announces the commission has already engaged the services of J. L. Jacobs, a Chicago expert, to standardize the salaries of all state employees. The decision has been reached by the commission to establish gradually courses of instruction whereby the profession of civil servants would be created. Dr. Prince says: "It has been a usual error on the part of men engaged in practical politics to regard civil service as a nuisance, a fifth wheel, impeding the activity of state and municipal departments, instead of helping along the work of government. This point of view has arisen, especially of late years, largely from a lack of co-operation between the heads of departments and the commissioners, whose duty it has been to administer the merit system. There can be no doubt that a remedy must be found to popularize civil service in the eyes of those whom the public has chosen to administer its common business and to bring our officials to see that the merit system is a real necessity for the efficiency of their own work. During the brief years in which civil service has existed in New Jersey, the legislatures and the state departments have unconsciously multiplied overlapping offices and have added to this confusion by creating misleading titles, often carrying with them salaries, not commensurate with the work to be done by their recipients. In consequence of this annually increasing disorder, civil service classifications are becoming more and more difficult. The present civil service commission, recognizing the exigencies of the situation and at the request of the governor, has secured the services of a competent standardizer, J. L. Jacobs, whose experience in Chicago and Milwaukee has turned the administration of those cities into models of civic method. It is the intention of the New Jersey Commission, however, not to rest content with mere standardization, but to hold one or more meetings, to which the governor and the heads of the state departments, as well as those of the more important municipalities, shall be invited, in order to express their views. What we need is more than a mere orderly classification. It is essential to make the state civil service a real career for young men to enter upon, which it distinctly is not at the present time. To accomplish such a result it will be necessary in New Jersey to follow, so far as possible, British-Indian precedents and establish within the state courses of practical instruction approved by the civil service commission, the successful following of which will place competitors in the position to rise in their chosen specialties. Of course, this can only be done gradually, and it has been suggested that we begin tentatively with courses for expert accountants and stenographers. We have two New Jersey institutions of learning, Princeton and Rutgers, whose services could be enlisted to further this work, and also a complete evening extension department of Columbia University already in operation in Newark, which could be of the greatest assistance."

Procedure in Abandoning Commission Form.

Madison, Wis.—Governor Philipp has signed the bill simplifying the method for the abandoning of commission form of government by a city if adopted. The question of abandonment must be submitted to a vote of the people and the direct question that shall be printed on the ballot is "Shall the commission form of government be abandoned?" Of the cities of the state that have adopted the commission plan most of them are enthusiastic over the results. In a few cities there are complaints. Because the old law on the subject of abandonment was ambiguous, it was deemed advisable to pass a new law on the subject. If a city votes to abandon the commission form, the next city election shall be held and conducted and the officers elected under the old form of government that existed before the adoption of the commission plan.

Salary Raises for Many Employes.

Dallas, Tex.—The city of Dallas will spend $59,510, approximately during the current year in raises to employes on account of the high cost of living. This amount will be paid, in nearly every instance, in raises of $5 monthly to employes getting less than $100 per month. About 1,000 employes will be affected. When the proposition of raises to meet the increased cost of living, occasioned, for the most part, by the war, was under discussion first, it was decided $10 monthly increase would be the proportion the employes should get. After a consideration of the budget, however, the available funds indicated, members of the board said, the salary advances must be cut in half. The street department was hit hardest, because advances were granted for teams as well as men. The advances in that department for all its divisions was a total of $21,150. Policemen will get $9,460 of the increase and firemen will get $10,000. Advances were granted in every department of the city to all employes receiving less than $100 per month, and the advances ranged as high as $7.50 in some instances.

TRAFFIC AND TRANSPORTATION

New York-New Jersey Tunnel Commission.

Trenton, N. J.—The much-discussed project of a series of tunnels from lower Manhattan to the New Jersey shore was advanced when governor Edge named the members of the new Hudson River Bridge and Tunnel Commission of New Jersey, which is to co-operate with the Bridge and Tunnel Commission of New York in the building of the tubes to help solve the New York-New Jersey traffic problem. The proposition favored by the New York commission is the construction of a pair of tunnels for foot passenger and vehicle traffic from about Canal Street on the New York side to Hoboken, at a cost of about $11,000,000. The first New Jersey commission was named about nine years ago. At that same time a New York commission was named. After some discussion, it was found that New Jersey law would not permit appropria-

tions of more than $100,000 without a referendum, and other laws stood in the way of the project. In 1914 a law was passed at Trenton providing that, if Hudson, Passaic, and Essex Counties agreed, a bridge district could be created and appropriations made for the construction of bridges or tunnels to Manhattan. Hudson and Passaic agreed right away, but it was not until last month that Essex accepted the proposal. Governor Edge named a commission of leading men: Thomas W. Lamont of Englewood, a member of J. P. Morgan & Co.; Franklin Murphy of Newark, T. Albius Adams of Montclair, Morris Rachlin of Newark, Theodore Boettger of Hackensack, William H. Noyes of Tenafly, Albion H. Allen of Jersey City, Palmer Campbell of Hoboken, Colonel J. H. Wells of Jersey City, and Thomas N. McCarter of Rumson as member at large. Mr. McCarter is president of the Public Service Corporation of New Jersey which favors the project of a bridge or tunnel connection. The members of the New York Commission are George R. Dyer, E. W. Bloomingdale, McDougall Hawkes, Alexander J. Shamberg and bridge commissioner F. J. H. Kracke. A number of borings have been made and estimates obtained by the New York commission and interested New Jersey individuals.

It is said that the sentiment is now in favor of a tunnel or tunnels because of the great cost of a bridge The latest estimate made for the commission, about a year ago, put the cost of a bridge spanning the Hudson near Canal Street, at $42,000,000. Mr. Bloomingdale said the cost would probably be as high as $55,000,000 now because of the high cost of materials and labor.. He said that the proposition of more than the two tunnels or of bridges would be considered by the two commissions, which would begin joint sessions soon, and would probably make a report to the next Legislatures of New York and New Jersey. This means that the tunnels, regardless of interference by war conditions, would not be begun before some time in 1918. The commissions will also consider the interstate construction of tunnels for carrying railroad tracks. At the recent hearing of the application of New Jersey interests for a freight rate preferential over New York equal to the cost of ferryage across the Hudson great emphasis was laid upon the effect of the situation of the construction of freight tunnels leading from the terminals of railroads in New Jersey over to Manhattan. The congestion and inconvenience due to the lighterage, experts testified, would be greatly relieved by direct underwater rail connections. The appointment of the commission was made possible by Essex County joining with Bergen and Hudson, each appropriating $10,000 for preliminary expenses. The engineering investigation is already well under way through the activity of the Public Service Corporation. A special committee of the company, reporting recently to the executive committee, expressed the hope that publicity regarding its investigations would "result in the early construction of the tunnel as a free public highway."

Legislative Inaction Delays Chicago Transit Plans.

Chicago, Ill.—The comprehensive transportation plans worked out after a long study by the traction and subway commission are to remain in the plan stage for another two years at least because of failure to take action on the part of the house at Springfield. The four bills embodying the necessary enabling legislation had passed the senate with a good majority and had been reported to the house committee on public utilities and gone to third reading when the committee adjourned finally without a record vote on any of the measures. Then the assembly adjourned after an all-night session.

Duluth Compromises in Railway Controversy.

Duluth, Minn.—Action on the proposed condemnation proceedings by the city to assume operating management of the street railway system will be postponed following the agreement reached between the city and the Duluth Street Railway Company. The immediate construction of the extension from Morgan Park to New Duluth, a universal 5-cent fare at the end of the war or not later than Jan. 1, 1920, and universal transfers on all lines now constructed or to be built within the city limits are the three features of the compromise It was announced that the United States Steel corporation is now preparing the right-of-way for the Morgan Park-New Duluth extension at a cost of $146,000. The extension will be 2¾ miles in length and must be in operation by the end of the year. Under the terms of the compromise the company would continue to charge an extra fare west of Eighty-fifth avenue west going west and east of Forty-ninth avenue west going east on the Morgan Park-New Duluth line until the time in the agreement. The compromise followed conferences by the city commissioners and the president of the company. Commissioner of public utilities P. G. Phillips was the only one to vote against the agreement, insisting on immediate municipal ownership. Mayor Magney stated that the compromise would not eliminate ownership by the city, but merely postpone it. Litigation pending in the district court to test the validity of a 10-cent fare, now charged on the Morgan Park line, will not be affected by the compromise.

Tentative Plans for Cleveland's Rapid Transit.

Cleveland, O.—Following the presentation of a report by the sub-committee on subways and city plan engineers to the city plan commission, mayor Harry L. Davis is trying to hasten action on the formulation of a definite plan for improving transit conditions in the city. The report of the sub-committee follows: "Information relative to Cleveland's traffic problems was obtained from Robert Hoffman, city engineer; W. A. Stinchcomb, county engineer; judge Fielder Sanders, street railway commissioner; Ferdinand Eggers, M. F. Bramley, O. P. Van Sweringen, W. P. McMenimen and J. F. Collins of the Dock Contractor Company; J. S. Kearney, traffic expert; E. P. Goodrich, traffic expert, and Bion J. Arnold, traffic expert. After carefully considering the present conditions, the committee believes that there are five possible methods of solving the city's general traffic problems: 1, A subway system; 2, an elevated system; 3, purchasing private rights of way; 4, a central district subway system; 5, a combination of the street railway system with the steam railways, utilizing the rights of way of the latter.

1, A subway system—It is said that subways do not pay in cities of less than two million inhabitants. The complete subway system would be the most expensive method of solving the problem and the authorities consulted advised against the establishment of subways in Cleveland for many years to come.

2, An elevated system—This solution would be less expensive than a subway system and yet it would involve a large expenditure. While the committee believes that an elevated system could be built here that would be less objectionable than those in other American cities, nevertheless it agrees with the authorities consulted who claim that elevated roads are undesirable because they reduce property value, present an unsightly appearance, create noise, scatter dirt and keep light from streets and buildings.

3, Purchasing private right of way—This method would be very expensive and is a practical possibility only in the outskirts of the city.

4, A central district subway system—This would include a subway terminal station under the public square and short tubes running east and west and south. The cost has been estimated at from $5,000,000 to $12,000,000, depending upon the size of the system. This would mean interest charges of from $275,000 to $660,000 annually.

According to the traffic commissioner, such a system would effect a saving in operation not exceeding $100,000. Consequently there would be a considerable sum to be paid annually, either by tax payers or by those who would be most beneficially affected, namely, adjacent property owners and automobile owners.

If the latter method of raising money should be deemed advisable, laws would be required to make this distribution of the expense possible.

There are two ways of providing this central district subway system. One, by the city through a bond issue and the second by the street railway company. The general opinion of those consulted is that this system should be owned and operated by the city.

5, A combination of the street railway system with the steam railways, utilizing the rights of way of the latter—It is said that the railroad's road beds could be widened so that street car tracks could be built either in the center of or on either side of the steam road tracks. Cleveland is so situated along the shores of Lake Erie and has so many railways entering it from different directions that there would seem to be a possibility of utilizing these rights of way, widened in the suggested manner.

There is a possibility of utilizing and combining plans four and five. This possibility—which is only a possibility—seems to be better and more economical than either the subway or elevated system and is well worthy of careful study. In view of the above facts the committee recommends the elimination from consideration at the present time of a complete subway system, of an elevated system and of the pri-

vate right of way plan—except as a contingent possibility in the suburbs and further recommends concentrated attention upon the central district subway system combined with the steam railway right of way idea. The committee considers the traffic problem as an important part of the city plan, and so closely involved in the general city planning scheme that definite recommendations concerning the solution of the entire problem should not be made until some comprehensive program of all city planning features is undertaken. The committee believes that the east approach to the new high level bridge should be extended at this time as a subway to the public square and so constructed as to be readily adaptable to any general subway terminal plan of the future. The completion of this one portion of a general subway scheme would have the immediate result of eliminating from the surface all west side cars which constitute approximately 40 per cent of the entire street railway traffic. The committee believes that completion of this part of the subway could be done at the present time at much less expense than hereafter in view of the fact that excavation work for the bridge approaches is now being done. The committee, therefore, recommends: 1st. Immediate construction of a subway from the easterly terminus of the new high level bridge up Superior avenue to connect with a subway terminal to be constructed in the public square. 2d. That the city should at once proceed to determine a comprehensive and definite program for a central subway terminal and approaches. 3d. That the general study of the city planning, including subway development, be taken up immediately.

Street railway commissioner Fielder Sanders said he believed if the city tackled the joint problem of traffic congestion and rapid transit with regard to the growth and future development of Cleveland and not in a piece-meal way, the bond issue would have a much better chance with the elector and would also save the city much future disorganization and at least $1,000,000 in money. His plan is to have two loops in the northwest and southwest corners of the public square. Instead of having a single track corresponding to that on Ontario street, he would have four tracks.

That would give anywhere from two to four times the loading space we now have, Mr. Saunders explained. The advantage of this plan is that we could take care of at least twice as much traffic, the increase we could handle being largely dependent upon the radius of the loops. I would build very deep, so that we could have two floors. The first underground floor would be a mezzanine something like the Union depot, with a platform running over the tracks. This would enable us to separate the traffic and the passengers would not have to cross any tracks. Of course, it would be more expensive than a single station, but it fits into the general comprehensive scheme which must come before long. It would take care not only of the surface cars, but would also provide for a fast suburban service.

"My idea is to build for the future, and the plan I have outlined would take care of the city's needs for at least ten or fifteen years. The present scheme is to cost something like $2,000,000. Why not spend $3,500,000 on my plan and have something that will last for years? The $2,000,000 scheme is barely sufficient for present needs and the extra cost of adding to the excavation when we proceed with the larger project will be tremendously increased by the difficulties under which the work will have to be done in the future." The city charter provides for a rapid transit commission of five members to serve without compensation, whenever it is decided that such a commission is needed. This commission would have the power to lease any underground railway or other rapid transit line to the Cleveland Railway. Mayor Davis desires that the commission be appointed at once.

English Municipal Railway Increases Receipts.

Leeds, England.—The receipts of the Leeds municipal tramways for the year ended March 31, 1917, amounted to £515,805 ($2,510,165), compared with £475,505 ($2,314,045) for the year ended March 31, 1916, an increase of £40,300 ($196,119), or 8.47 per cent. This is the first time the receipts have amounted to £500,000, a result which is due to the increased number of passengers carried on existing routes—112,000,000, against 103,000,000 during the preceding year. The number of miles covered by the cars was 9,658,595, compared with 9,405,121 the preceding year. The profits for the year are estimated at £79,470 ($386,740), after £25,000 ($121,662) has been placed to the reserve fund.

MISCELLANEOUS

Men Who Will Build Cantonments.

Washington, D. C.—Actual construction work at each of the sixteen cantonments to be erected for the new National Army will be in charge of an officer of the Quartermaster Corps, either Regular or Reserve, to be known as the constructing quartermaster. Under him will be an assistant quartermaster. The constructing quartermaster will be in full charge at each cantonment, directing the laying out of the buildings and supervising for the Government the entire work of construction as carried on by the contractor. The personnel of the constructing quartermasters includes a number of well-known civilian engineers who have been given major's commissions in the Quartermaster Reserve Corps. In addition, several officers of the Regular Army Quartermasters' Corps are acting in executive capacity. Among the men appointed from civil life are: Maj. O'Kelly Williams Myers, an engineer of the New York water department, who will be in charge at Yaphank, L. I.; Maj. Ralph Fenne Proctor, chief engineer of a Baltimore bonding company, who has been assigned to the cantonment at Annapolis Junction, Md.; Maj. William Couper, an engineer for the Pennsylvania Railroad, who will be at Columbia, S. C.; Maj. James Norman Pease, principal assistant engineer of the Lockwood-Green Construction Co., of Columbus, Ga., who will be at the head of operations at Atlanta; Maj. Frank Elmer Lamphere, assistant engineer of the Baltimore & Ohio Co. at Chicago, assigned to Louisville, Ky.; Maj. Earle Bell Morden, a St. Paul railroad engineer, who will be at Battle Creek, Mich.; Maj. Donald Hubbard Sawyer, of Spokane, Wash., to be in charge at Rockford, Ill.; Maj. John R. Fordyce, a civil engineer of Little Rock, Ark., who will supervise the construction of the cantonment in that city; Maj. Millard Angle Butler, a St. Paul railroad engineer, to be in charge at Des Moines. Regular Army officers named as constructing quartermasters are: Capt. Edward Canfield, jr., Ayer, Mass.; Maj. Harry C. Williams, Wrightstown, N. J.; Capt. Frank B. Edwards, Petersburg, Va.; Capt. Ward Dabney, Chillicothe, Ohio; Capt. Frank J. Horman, Fort Riley, Kans.; Capt. George E. Thorne, Fort Sam Houston, Tex.; and Capt. David L. Stone, American Lake, Wash. The following officers have been named as assistant quartermasters: Capt. Graham Parker, Annapolis Junction; Capt. Thomas W. Holliday, Columbia, S. C.; Capt. Mark L. Ireland, Louisville; Capt. Manuel N. Garrett, Battle Creek; Capt. Owen G. Collins, Rockford; Capt. Joseph C. Kay, Des Moines.

Daylight Saving Adopted.

Springfield, Mass.—On July 1, the daylight saving plan officially went into effect in this city, clocks being set one hour ahead, according to an ordinance recently unanimously passed by the city council. Holyoke, Chicopee, West Springfield, Longmeadow, Agawam, Westfield and practically all cities and towns in the western part of the state will follow the lead set by Springfield, according to information obtained by the special investigating committee. Worcester and several other cities in the eastern part of the state have been considering similar action. The ordinance provides that the time of the 60th meridian of longitude west from Greenwich shall be the official time in this city for the transaction of city business. This is just one hour ahead of the existing time. This measure, it is understood, does not compel private interests to change their clocks, but it is believed that every manufacturing industry and business house will follow suit. City clerk E. A. Newell is of the opinion the new law will cause some conflict with state regulations. According to the state statutes his office must be kept open until 5 each day for the filing of mortgages and other business of like nature. Mr. Newell will at once obtain an opinion as to whether he will be required to observe the city or state time. Railroad time will remain the same, unless the plan should be adopted throughout the state, in which case it is understood that the transportation companies will alter their schedules to meet the new conditions.

NEWS OF THE SOCIETIES

Calendar of Meetings.

July 10-12.—MUNICIPAL LEAGUE OF INDIANA. Annual convention, Shelbyville, Ind. Secretary, W. S. Jones, City Clerk, Shelbyville.

July 12, 13.—LEAGUE OF MICHIGAN MUNICIPALITIES. Annual convention, Grand Rapids, Mich. Secretary, Charles A. Sink, Ann Arbor, Mich.

July 24-27.—DOMINION ASSOCIATION OF FIRE CHIEFS. Annual convention, Port Arthur and Fort William, Ont. Secretary, James Armstrong, Chief, Fire Department, Kingston, Ont.

July 30-Aug. 3.—SOUTHERN SOCIOLOGICAL CONGRESS. Annual meeting, Blue Ridge, N. C. Secretary, J. E. McCulloch, 508 McLachlen Bldg., Washington, D. C.

Aug. 1-3.—AMERICAN SOCIETY OF SANITARY ENGINEERING. Annual meeting, Grand Rapids, Mich. President, William C. Groeninger, Ohio State Board of Health, Columbus, O.

Aug. 6.—PACIFIC COAST ASSOCIATION OF FIRE CHIEFS. Twenty-fifth convention, Anaconda, Mont. Secretary, ex-Chief H. W. Bringhurst, Seattle, Wash.

Aug. 15-17.—LEAGUE OF WISCONSIN MUNICIPALITIES. Annual convention, Racine, Wis. Secretary, Ford H. MacGregor, Madison, Wis.

Aug. 21-23.—NEW YORK STATE FIREMEN'S CONVENTION, Flushing, N. Y. Secretary, Thos. Honohan, Frankfort, N. Y.

Aug. 22.—UNION OF NEW BRUNSWICK MUNICIPALITIES. Annual convention, St. John, N. B. Secretary, James King Kelley, St. John.

Aug. 27-29.—UNION OF CANADIAN MUNICIPALITIES. Annual convention, London, Ont. Secretary, W. D. Lighthall, K.C., Westmount, Que.

Sept. 5-8.—LEAGUE OF AMERICAN MUNICIPALITIES. Annual convention, Gary, Ind. Secretary, Robert E. Lee, City Hall, Baltimore, Md.

Sept. 11-13.—AMERICAN ASSOCIATION OF PARK SUPERINTENDENTS. Annual convention, St. Louis, Mo. Secretary, Roland W. Cotterill, 533 City Hall, Seattle, Wash.

Sept. 11-14.—NEW ENGLAND WATERWORKS ASSOCIATION. Annual convention, Hartford, Conn. Secretary, Willard Kent, 715 Tremont Temple, Boston, Mass.

Sept. 18-20.—LEAGUE OF VIRGINIA MUNICIPALITIES. Annual convention, Lynchburg, Va. Secretary, L. C. Brinson, Portsmouth, Va.

Sept. 24-29.—LEAGUE OF CALIFORNIA MUNICIPALITIES. Annual convention, Santa Rosa, Cal. Secretary, Wm. J. Locke, Pacific Building, San Francisco, Cal.

Sept. 27-29.—AMERICAN AND CANADIAN ENGINEERS AND ARCHITECTS OF NORWEGIAN BIRTH OR DESCENT. Informal congress and re-union, Chicago Norske Klub, Chicago, Ill. Chairman, Committee on Arrangements, Joachim G. Glaver, consulting engineer, Chicago, Ill.

Oct. 15-17.—NATIONAL HOUSING ASSOCIATION. Annual conference, Hotel La Salle, Chicago, Ill. Secretary, Lawrence Veiller, 105 East 22d St., New York City.

Oct. 17-18.—LEAGUE OF MINNESOTA MUNICIPALITIES. Fifth annual convention, St. Cloud, Minn. Secretary-treasurer, Richard R. Price, University of Minnesota, Minneapolis.

Nov. 21-24.—NATIONAL MUNICIPAL LEAGUE. Twenty-third annual meeting, Hotel Statler, Detroit, Mich. Secretary, Clinton Rogers Woodruff, 703 North American Bldg., Philadelphia, Pa.

Nov. 20-23.—PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA. Recreation Congress, Milwaukee, Wis. Secretary, H. S. Braucher, 1 Madison Ave., New York, N. Y.

National Conference of Social Work.

The forty-fourth annual meeting of this conference, formerly the National Conference of Charities and Correction, was held at Pittsburgh, Pa., June 6-13. New officers were elected as follows:

President, Robert A. Woods, Boston; vice-presidents, John A. Kingsbury, New York, Judge William A. Way, Pittsburgh, Florence Kelley, New York; members of the executive committee, Roy Smith Wallace, Mrs. W. L. Murdoch, Rev. Frederick Seidenberg, Ida M. Cannon, Otto W. Davis and Marcus C. Fagg.

Chairmen of divisions were appointed as follows: Children, Henry W. Thurston; Delinquents and Correction, Jessie A. Hodder; Health, Dr. J. H. Landis; Public Agencies and Institutions, Albert Sidney Johnstone; The Family, Gertrude Vaile; Industrial and Economic Problems, Florence Kelley; The Local Community, Charles C. Cooper; Mental Hygiene, Dr. William Healy; Organization of Social Forces, Allen T. Burns; Social Problems of the War and Reconstruction, V. Everitt Macy.

A plan was discussed to ally more closely to the conference kindred organizations. Action on the plan was taken as follows: Five will remain completely independent, including the American Association of Societies for Organizing Charity, National Conference of Jewish Charities and National Conference of Jewish Social Workers; nine will retain independent existence but will unite their programs with the National Conference—among these are National Conference on Urban Conditions Among Negroes, National Housing Association, International Association of Policewomen and American Social Hygiene Association; eight will become integral parts of the National Conference—Teachers of Practical Sociology, Industrial Social Service Group, Group on Charities Endorsement, Charities Federation and Central Councils of Social Agencies, Officials of Charities and Corrections, Presidents and Secretaries of State Conferences, Land Taxation Group and Special Committees on Radical Social Movements.

League of Texas Municipalities.

Organization of the Texas Council of Public Health Agencies, the election of officers for the ensuing year, discussion and consideration of public health work now in progress, the reading of reports of various committees and discussion of the subject, "Sewerage and Sanitation," occupied the final session of the League of Texas Municipalities which was held at Dallas, June 20-22.

Officers elected for the following year are: Mayor W. H. Knight, Hillsboro, president; Mayor J. H. Painter, Crockett, first vice-president; C. I. McFarlane, Richmond, second vice-president; E. L. Wells, city manager of San Angelo, third vice-president. Dr. W. B. Collins, State Health Officer, was elected an honorary member of the league.

Fifteen unofficial health agencies were represented at the organization meeting of the Texas Council of Public Health Agencies, almost all of which have headquarters in widely varying points in Texas. Among the most prominent of the organizations were the Dallas Federation of Women's Clubs, the Dallas Association for the Study and Prevention of Tuberculosis and the Texas Public Health Association. A constitution and by-laws were adopted. James A. Rawlings of Fort Worth was elected president, and D. E. Breed, executive secretary of the Texas Public Health Association, of Austin, was elected secretary of the new organization.

The meeting was called to order by Dr. W. B. Collins, State Health Officer, who urged the co-ordination of the interests of the public health agencies into one organization, primarily for the prevention of duplication of efforts.

Galveston, Clifton, Waco and Midland have been offered as convention cities for 1918. The final choice will be made by the executive committee, and all cities desirous of obtaining the convention are entitled to make application to the secretary, accompanied by reasons why the convention should be awarded them.

Prof. Herman G. James of the University of Texas presented the secretary-treasurer's report for the year, the fiscal end of which is in November. During the fiscal year, beginning November 1, 1916, nine new active members have been added to the league, as follows: Athens, Clifton, Crockett, San Angelo, Sinton, Texarkana, Texas City, Mart and Honey Grove. Forty-three new associate members have been added also during this period. The league now has fifty-two active members and forty-four associate members. The report showed that the secretary's office, in connection with the University of Texas bureau of municipal research and reference, has supplied many hundreds of people with information regarding municipal affairs, and has furnished many local addresses on municipal topics. It was suggested that students of the University who specialize in municipal work be employed by Mayors and officials of Texas towns, both for the benefit of the towns and the students.

Dr. H. H. Smiley of the Cotton Belt Railroad explained the anti-malaria campaign being conducted by that company along its lines. He cited the work being done to prevent disease among stock and cattle and said that modern society is more careless with its human beings than it is with its animals. Malaria is one of the worst scourges or plagues existing, although

it is not spectacular, he said. Since the campaign was inaugurated the cities and towns traversed by the Cotton Belt lines have gradually come to appreciate the value of the anti-malaria work and have extended unstinted co-operation to the railroad and Government officials engaged therein. Tyler, which has been ditched for draining purposes, has been given its initial cleaning and men have been appointed to maintain the work thus far done. Work is now being done at Lufkin on the same scale. Many lectures on health and sanitation subjects have been given and many moving pictures and stereopticon pictures have been shown to illustrate the value of the work. The railroad is anxious to further promote the work and asks the co-operation of all cities, towns and individuals affected by malaria along its lines, Dr. Smiley said.

Dr. P. W. Covington, director of the bureau of rural sanitation of the State Health Department, who recently met with the Dallas County Commissioners' Court regarding a health survey of this county, which was decided upon, outlined the procedure which would be followed in the campaign. The force to which this work will be intrusted will consist of a trained physician as field director, one technical clerical assistant, one health inspector and laboratory worker and four assistants to carry out the details assigned to them. The county is only required to compensate the four assistants, the State and the International Health Board bearing the remainder of the expense, he said. Any county which will appropriate $200 a month for employment of the four assistants may have a health survey made within its confines. Full details of how the work will be carried through were given by Dr. Covington.

Dallas County has a rural population of approximately 30,000, with an average of 540 deaths each year, 200 of which are preventable. The fact that this number of deaths is preventable creates an obligation upon society to prevent them, and the County Commissioners' Court realized this fact when it appropriated the health survey, Dr. Covington said.

An enumeration in part of the achievements of the Dallas Public Health Department for the last year was given by H. W. Van Hovenberg. Some of the accomplishments given follow: Organizations of the anti-tuberculosis society, a survey of part of the territory occupied by negroes in Dallas during negro health week, the extension of anti-malarial work to Bachman's Dam for the purpose of diminishing infection of the many campers who go there, the promotion of vaccination for smallpox among the employes of large Dallas concerns, the installation of an expert dietician at the City Hospital, the employment of a full-time physician for the Emergency Hospital, the passage of common towel and drinking cup ordinances, the scoring of restaurants and public eating and drinking places, the sanitary supervision of the State Fair, the examination of public bathing places, report on the design for the sewage plant recently placed in operation, the health department was instrumental in obtaining the construction of an incinerator, and the scoring of dairies, for which information thousands of inquiries have been received by the department officials.

In substitution for Dr. Witte, Mayor Knight of Hillsboro gave a brief report on the health survey work being done in Hill County, which, he said, includes the inspection of every home in the county and the dissemination of much valuable publicity matter regarding preventable diseases. The slogan

(*Continued on page 20*)

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

St. James, Minn., is improving its WATERWORKS. The engineer for the work is J. G. Robertson, 2542 University avenue, St. Paul.

SEWERS are being constructed by Oakmont, Pa., plans and specifications having been prepared by Douglass & McKnight, 1315 Union Bank building, Pittsburgh, Pa.

Skagit County, Mt. Vernon, Wash., is rebuilding a BRIDGE. The engineers are Bowermen & McCloy, Mutual Life building, Seattle, Wash.

Improvements are to be made to the WATERWORKS of Weston, Ont., according to plans and specifications being prepared by James, Loudon and Herzberg, Toronto, Ont.

A BRIDGE is to be constructed by the City of Maine, Fla. The plans and specifications for the structure have been prepared by Harrington, Howard & Ash, Orear-Leslie building, Kansas City, Mo.

WATERWORKS and an ELECTRIC LIGHT PLANT to cost $35,000 are proposed for Wilson, Okla. The Benham Engineering Company, Colcord building, Oklahoma City, Okla., has been retained in a consulting engineering capacity.

The Savanna & York Drainage district, Savannah, Ill., is building a PUMPING STATION. Plans and specifications for the work have been prepared by the Edmund T. Perkins Engineering Co., First National Bank building, Chicago, Ill.

McConnellsville, O., is making SEWER improvements. The engineer who prepared plans and specifications for the work is F. B. Pinley, Malta, O.

Morton Grove, Ill., in making STREET IMPROVEMENTS, followed plans and specifications prepared by Edgar & Rossiter, 82 W. Washington street, Chicago, Ill.

A SEWERAGE SYSTEM is to be built by Grand Meadow, Minn. The engineers are Rose & Harris, 471 Auditorium building, Minneapolis, Minn.

Westfield, N. Y., is to construct WATERWORKS to cost $80,000. The engineers are Gannett, Seelye & Fleming, 204 Locust street, Harrisburg, Pa.

A SEWERAGE SYSTEM and SEWAGE DISPOSAL PLANT are to be built by Spirit Lake, Ia., plans having been completed by the engineer, C. H. Currie, Webster City, Ia.

The Chamber of Commerce, Reading, Pa., is studying the problem of GRADE CROSSING ELIMINATION. The chamber has engaged H. H. Althouse, Woolworth building, New York, N. Y., as consulting engineer to make a report.

Horse Heaven Irrigation District has voted $18,000,000 to complete its IRRIGATION SYSTEM. The engineers for the big project are R. H. Thomson, Alaska building, Seattle, Wash., O. Laurgaard, Railway Exchange building, Portland, Ore., and A. J. Wiley, Butte, Mont.

PERSONALS

Barbour, C. D., has been appointed chief of police of Raleigh, N. C.

Brown, Chas. C., for more than 20 years editor of "Municipal Engineering," severed his connection with that periodical beginning with the June issue.

Carnes, Dr. A. W., has been appointed city health officer of Dallas, Tex.

Grady, J. William, manager of the traffic bureau of the Syracuse Chamber of Commerce, has been appointed traffic manager of the New York state barge canal.

Hartwell, D. A., for many years city engineer of Fitchburg, Mass., and later engineer for the new sewer systems, has retired from the city service.

Lee, Ben, has been elected city engineer of Hutchinson, Kans., succeeding G. L. McLane, who has resigned to act as captain of Co. A, Engineer Corps, Kansas National Guard.

Maddock, Thomas, has been appointed state engineer of Arizona, succeeding Lamar Cobb, resigned.

Olmsted, H. B., has been appointed superintendent of highways and bridges for town of Darien, Conn.

Rights, Will, has been made assistant engineer of the Indiana State Highway Department.

Winslow, Prof. A. D., of Norwich University, has been made city engineer of Montpelier, Vt.

Woods, James Whitfield, vice-president and treasurer of Tippett & Wood, Phillipsburg, N. J., died recently.

INDUSTRIAL NEWS

Cast Iron Pipe.—Prices remain at the high level of last week, following the sensational increase of $5 a ton. Quotations: Chicago—4-inch, class B and heavier, $68.50; 6-inch, $65.50. New York—4-inch, class B and heavier, $68.50; 6-inch, $65.50. Birmingham—4-inch, class B and heavier, $63; 6-inch, $60; class A, $1 extra.

The Medora Shale Brick Company, Medora, Ind., of which Mr. N. V. Trautman is president, has joined the family of licensees of The Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio. The addition of the Medora company gives the Dunn company 46 licensees, operating 71 plants in 12 states.

National Concrete Pavement.

The Bituminized Road Co. has just secured patents for a new pavement which it calls "National Concrete," which consists of the material that is called "National" pavement, mixed with broken stone. The National pavement is a mixture of about 75% dust and 25% asphaltic cement; and about 33 1/3% of this mixture, by weight, is mixed with 66 2/3% of broken stone. By volume, the final mixture contains approximately 42% of the bituminous earth mixture, more than enough to fill the voids in the stone. The stones do not touch each other and are not relied upon for stability, and there is no effort to secure any special grading of coarse aggregate to reduce voids to a minimum; but the chief object of the stone is to reduce the cost, the pavement containing only 8 1/3% of asphaltic cement, by weight, or 16 2/3 lbs. per square yard 2 inches thick. No sand is used. In one method of manufacture, gravel or broken stone together with any associated dirt is run through a pulverizer, the dust resulting is mixed with the asphalt, and the larger particles that come through the pulverizer uncrushed are used as the coarse aggregate.

The Walter A. Zelnicker Supply Co., St. Louis, Mo., announces that it has secured the services of Mr. W. H. Dayton, as city salesman. Mr. Dayton was formerly with the Railroad Supply Co., Chicago, Illinois, as secretary and purchasing agent; also the eastern representative for five years. He came to Saint Louis seven years ago representing the same firm and that of the Chicago Signal & Supply Co., and the Elyria Iron & Steel Co., manufacturers of signal and track maintenance materials.

The Barrett Company has just issued four new booklets on "Tarvia" and its uses in road and pavement construction. This new literature covers "Tarvia X," used for binder purposes; "Tarvia-A," for hot surface-treatments, and "Tarvia-B" for cold surface treatments. The materials are fully described and the methods of their use on various types of pavements are clearly specified in detail. All the points brought out are illustrated with "before-and-after" pictures of fine pavements in all parts of the country and by very interesting photographs taken on the job. One of the booklets deals especially with "How a Tarvia Macadam Roadway Is Constructed," and each step in the work is thoroughly explained and illustrated, the unusual method being used of devoting a page to each step, with an illustrative photograph on the opposite page. The accompanying cuts show an example of the interesting and useful material to be found in the booklets and illustrate "Penetration Methods of Applying and Handling Tarvia-X."

The Blaw Steel Construction Co., Pittsburgh, and the **Knox Pressed & Welded Steel Co.,** Wheatland, Pa., has been merged July 1 as the Blaw-Knox Co., a change of name under the charter of the present Blaw Steel Construction Co. The authorized capitalization will be $2,000,000. The plant of the Blaw Steel Construction Co. manufactures steel forms for concrete work, steel transmission towers, clam shell buckets, and general structural steel fabrication. The plant of the present Knox Pressed & Welded Steel Co. manufactures water cooling devices for open-hearth furnaces, and also heavy hydraulic pressed steel plate work. The general sales offices of the company will be in Pittsburgh, with branch offices, as they now exist, in New York, Chicago, Boston and San Francisco, with general executive offices at Hoboken, Pa. The present officers of the Blaw Steel Construction Co. retain their present titles in The Blaw-Knox Co., and the board of the present Blaw Steel Construction Co. will be increased to include five of the directors of the Knox Pressed & Welded Steel Co.

Bids on 35,000 Army Trucks.

The War Department's request for bids for 35,000 army motor trucks brought response from eighty-seven concerns, and when the offers were opened it was found that the number for which bidders were ready to contract was many times the Government's requirements. How many will be ordered has not been determined. The estimate of 35,000 made in asking for bids was based on the maximum

Filling auto-truck from storage-tank.

Spreading Tarvia with hand-pouring pot.

Spraying with pressure-nozzle.

Spraying "Tarvia-X" under pressure.

Storage tanks for Tarvia.

PENETRATION METHODS OF APPLYING AND HANDLING "TARVIA-X."

transport needs of an army of 2,000,000 men.

Practically all the big motor companies and many of the smaller concerns submitted bids. Many types and sizes were offered, the prices ranging from $1,031 for one-ton trucks to $4,600 for five-ton vehicles. Some of the manufacturers are ready to begin delivery at once and others set varying delivery rates, ranging up to six months in the future. Three concerns —the Pierce-Arrow Motor Car Company, the Hurlburt Motor Truck Company, and the Nash Motors Company —each offered to build the whole 35,000. Three companies offered to build trucks at cost plus 10 per cent. profit. Offers to turn out ten trucks a day comes from two firms with no limit set on the total. It is estimated that there are not more than 40,000 motor trucks on the Allies western battle front in Europe, that number having proved ample for the needs of the British, French and Belgian fighting forces. For this reason some officials feel that the War Department should not go above its estimate of 35,000 as the total to be ordered. It is expected that those offering quickest deliveries will receive preference in the placing of contracts.

A Motor Truck Railroad.—While motor trucks up to this time have operated only in the "short haul field," as "feeders" to the railroads, the **Goodyear Tire & Rubber Company,** Akron. O., has for some time prophesied the establishment of motor transportation lines not confined to short hauls of 25 to 75 miles, but covering routes of hundreds of miles. In fact, not only has the operation of lines maintaining regular schedules, night and day, between cities, been visualized, but has actually been transformed into reality.

Now in the present rail congestion, the Goodyear Company has inaugurated this new era in the transportation world through the establishment of a line operating between its factory at Akron, O., and Boston, Mass., hauling tires to its eastern branches, and returning laden with cotton fabric from the Goodyear Cotton Mills, at Goodyear, Conn., a trip of 1,540 miles. Three round trips have already been made, the last of which was accomplished in seven and one-half days. The truck used on these pioneer trips is a 5-ton Packard of standard motor and chassis, fitted with a special body. Behind the driver's seat is a special sleeping compartment, the width of the truck cab, containing a bunk, used by the two truck drivers in relays. It might be supposed that sleeping on a motor truck would be somewhat difficult, but the cushioning qualities of the 38 x 7 front, and 44 x 10 rear pneumatic cord tires, with which the wheels are fitted, renders the sleeping quarters quite comfortable. The load carrying portion of the truck is of stake body, covered with a large tarpaulin bearing a large sign reading "Akron—Boston Express." A 44 x 10 tire carried on the end gate serves both as a spare and an exhibition tire. The tires used are of the same construction as other Goodyear Cord tires, except that they carry a large number of plies of cords and much additional rubber. They carry a five-ton load with no more damage to the road than that caused by an ordinary touring car. The tire is sufficiently large to cushion the load, absorbing all shocks and distributing the weight over a greatly increased section of it. With the use of these big tires, allowing transportation of heavy loads without damage to the road surface, the opposition to the operation of truck transportation lines, which has been aroused by the pounding and pulverizing action of many solid-tired heavy-duty trucks on the foundations of the roads, will be withdrawn, for it is not the heaviness of the load that breaks up the road surface, but the jolting and pounding and intense vibration caused by lack of proper cushioning. Now that the Goodyear Company has apparently proven that long hauls by motor trucks can be successfully accomplished, it is expected that many other long distance routes will be established by other concerns.

NEWS OF THE SOCIETIES

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of the county is "100 per cent sanitation," he said. At first the survey moved slowly because the people were not awake to its importance, but since they have become aware of its value full co-operation has been extended.

The afternoon session was opened with a report by the committee on sewage and sanitation, made by Chairman J. H.Painter, Mayor of Crockett. The report showed that more than $3,000,000 had been spent dring the last year for the installation of sewage systems in cities and towns in Texas. It was reported that some cities in Texas have taken no steps in compliance with the State anti-pollution act, due largely to the inability of city officials to finance the work. Many cities, because of the cost of sewage disposal systems required by the State under the anti-pollution act, have permitted their interest in other essential public health activities to relax, the report said. Some discussion was evoked as to the advantages of the bucket system of dry closets, and also regarding the means and cost of disposing of waste under this system.

"Next Needs in Stream Protection in Texas" was the subject of an address by V. M. Ehlers, State Sanitary Engineer. Mr. Ehlers gave an account of work being done by the State Sanitary Department in co-operation with army officials in constructing sanitary conditions for the army camps to be located in Texas. A sewage disposal plant is being constructed at Leon Springs, to cost more per capita of users than any system in Texas, he said. Improper disposal of human waste results in 75 per cent of all human illness, and the final success of the war will rest largely on the improvement of sanitary conditions and the raising of human efficiency with sanitation, he said.

Stream pollution in Texas has not yet been obviated, Mr. Ehlers said, basing his statement on the many complaints received from farmers that their cattle are drying from drinking water in certain rivers, and from others that they can not irrigate because of the polluted water in several Texas rivers. Fish have been reported dying in schools in some of the streams, mainly among which are the Colorado, Trinity, West Fork and two West Texas rivers. Many towns lack funds with which to comply with the law. Two years ago the sanitary department was afraid to institute suits against these cities, but this action will be taken soon, with every confidence of successful verdicts, Mr. Ehlers said. Now that many cities have new sewage disposal plants, they should be maintained in good condition. The State will hold all cities responsible for the effective operation of their plants and the standard of effluent must be maintained.

League of Pennsylvania Third Class Cities.

The annual convention of the League of Cities of the Third Class in Pennsylvania, to be held in Hazleton, will be on August 28, 29 and 30.

A number of matters held over from last year's convention will be up again at the coming convention. The resolution of Mr. Hahn, of McKeesport, that an effort be made to have the Legislature pass a bill permitting the use of terra-cotta pipe in plumbing in third class cities will be voted upon. Johnstown's taxation bill will probably be brought up again.

Indiana Electric Light Association.

"War Times and the Central Station Business" was the topic on which F. S. Hunting, general manager Fort Wayne (Ind.) works of the General Electric Company, addressed commercial men of the Indiana Electric Light Association at Fort Wayne on June 20.

Thomas Donahue, of Lafayette, presented a paper entitled "Organization of New-Business Departments," which was discussed by S. T. Sharp, Evansville; C. B. Young, Rochester; Samuel Mott, Noblesville, and P. C. Pfenning, Indianapolis.

The paper on "Increasing Load Factor of Existing Lines," by N. A. Perry, of Indianapolis, was discussed by M. S. Caldwell, South Bend; E. S. Goodrich, Winchester; C. M. Poor, Clinton, and C. A. Nash, Lafayette.

Discussion of a paper on "Development of the Sale of Socket Appliances," by Milton Hennoch, East Pittsburgh, Pa., was led by H. C. Goldbrick, Chicago; W. H. Crawford, Hammond, and M. V. Stagg, Fort Wayne.

The association will probably hold a one-day convention in July instead of the usual three-day session in September.